Language, Style and Format drivers
for **Listings**

by Carsten Heinz and individual authors:

Knut Lickert   Stefan Pinnow   Andreas Matthias
Torsten Neuer   Michael Franke   Andrew Zabolotny
Dr. Christoph Giess   Robert Frank
José Romildo Malaquias   Jens T. Berger Thielemann
Michael Fiedler   Michael Piefel   Michael Piefel
Detlev Dröge   Jörg Viermann   Martin Brodbeck
Patrick Cousot   Stephan Hennig   Martin Heller
Kai Below   Riccardo Murri   Scott Pakin   Ralf Schandl
Christian Gudrian   Daniel Gazard   Detlef Reimers
Heiko Oberdiek   Christian Maurer   Mark van Eijk
Ignacio Díaz-Emparanza   Riccardo (Jack) Lucchetti
Sven Schreiber   Peter Bartke   Matthias Bethke
Jürgen Heim   Jonathan Sauer   Robert Wenner
Martine Gautier   Bastian Germann   Jeffrey Ratcliffe
Mark Schade   Stefan Lagotzki   Jobst Hoffmann
Scott Pakin   Stephan Hennig   Stephan Hennig
Rolf Niepraschk   Markus Pahlow   Michael Wiese
Oliver Ruebenkoenig   Simon Pearce   Dominique de Waleffe
Ralph Becket   Uwe Siart   Brooks Moses   Peter Bartke
Adam Grabowski   Torben Hoffmann   Christopher Creutzig
Achim D. Brucker   Ulrich G. Wortmann
Sebastian Schubert   Andres Becerra Sandoval
Luca Balzerani   Alessio Pace   Christophe Jorssen
Berthold Höllmann   William Thimbleby   Herbert Voss
Michael Weber   Stephen Kelly   Alexis Dimitriadis
Patrick TJ McPhee   Geraint Paul Bevan   Brian Christensen
Christian Kaiser   Xavier Noria   Jean-Philippe Grivet
Aidan Philip Heerdegen   Christoph Kiefer   Christian Haul
Neil Conway   Stefan Jager   Gerd Neugebauer
Winfried Theis   Robert Denham   Sonja Weidmann
Cameron H. G. Wright   Kai Wollenweber   Steffen Klupsch
Oliver Baum   Bernhard Walle

2023/02/27   Version 1.9

Abstract

This article describes the implementation of the language drivers for the listings package.

Contents

1 Installation and configuration

```
1 %% The listings package is copyright 1996--2004 Carsten Heinz, and
2 %% continued maintenance on the package is copyright 2006--2007 Brooks
3 %% Moses. From 2013 on the maintenance is done by Jobst Hoffmann.
4 %% The drivers are copyright 1997/1998/1999/2000/2001/2002/2003/2004/2006/
5 %% 2007/2013 any individual author listed in this file.
6 %%
7 %% This file is distributed under the terms of the LaTeX Project Public
8 %% License from CTAN archives in directory  macros/latex/base/lppl.txt.
9 %% Either version 1.3c or, at your option, any later version.
10 %%
11 %% This file is completely free and comes without any warranty.
12 %%
13 %% Send comments and ideas on the package, error reports and additional
14 %% programming languages to Jobst Hoffmann at <j.hoffmann@fh-aachen.de>.
15 %%
16 ⟨∗install⟩
17 \input docstrip
18 \preamble
19 \endpreamble
20
21 \ifToplevel{
22 \usedir{tex/latex/listings}
23 \keepsilent
24 \askonceonly
25 }
26
27
28 \generate{
29     \file{lstlang1.sty}{\from{lstdrvrs.dtx}{lang1}}
30     \file{lstlang2.sty}{\from{lstdrvrs.dtx}{lang2}}
31     \file{lstlang3.sty}{\from{lstdrvrs.dtx}{lang3}}
32 }
33
34 \generate{
35     \file{listings-acm.prf}{\from{lstdrvrs.dtx}{acm-prf}}
36     \file{listings-bash.prf}{\from{lstdrvrs.dtx}{bash-prf}}
37     \file{listings-fortran.prf}{\from{lstdrvrs.dtx}{fortran-prf}}
38     \file{listings-hansl.prf}{\from{lstdrvrs.dtx}{hansl-prf}}
39     \file{listings-lua.prf}{\from{lstdrvrs.dtx}{lua-prf}}
40     \file{listings-python.prf}{\from{lstdrvrs.dtx}{python-prf}}
```

```
41 }
42
43
44 \ifToplevel{
45 \Msg{*}
46 \Msg{* You probably need to move all created '.sty' and '.cfg'}
47 \Msg{* files into a directory searched by TeX.}
48 \Msg{*}
49 \Msg{* Run 'lstdrvrs.dtx' through LaTeX2e to get the documentation.}
50 \Msg{*}
51 }
52
53 \endbatchfile
54 ⟨/install⟩
55 ⟨∗config⟩
```

We mainly define default dialects.

```
56 \ProvidesFile{listings.cfg}[2023/02/27 1.9 listings configuration]
57 \def\lstlanguagefiles
58     {lstlang0.sty,lstlang1.sty,lstlang2.sty,lstlang3.sty}
59 \lstset{defaultdialect=[R/3 6.10]ABAP,
60         defaultdialect=[2005]Ada,
61         defaultdialect=[68]Algol,
62         defaultdialect=[gnu]Awk,
63         defaultdialect=[ANSI]C,
64         defaultdialect=[light]Caml,
65         defaultdialect=[1985]Cobol,
66         defaultdialect=[WinXP]command.com,
67         defaultdialect=[ISO]C++,
68         defaultdialect=[95]Fortran,
69         defaultdialect=[11.0]Mathematica,
70         defaultdialect=[OMG]OCL,
71         defaultdialect=[Standard]Pascal,
72         defaultdialect=[67]Simula,
73         defaultdialect=[plain]TeX,
74         defaultdialect=[97]VRML}
75 \lstalias[]{TclTk}[tk]{tcl}
```

And now some shortcuts for the ABAP versions (provided by Knut Lickert). I (Knut) think the leading R/2, R/3 is not necessary (The support for R/2 is finished). The version number with letter is important for the runtime-system, but the programming language should be the same for each version.

```
76 \lstalias[6.1]{ABAP}[R/3 6.10]{ABAP}
77 \lstalias[3.1]{ABAP}[R/3 3.1C]{ABAP}
78 \lstalias[4.6]{ABAP}[R/3 4.6C]{ABAP}
79 ⟨/config⟩
80 ⟨+lang1⟩\ProvidesFile{lstlang1.sty}
81 ⟨+lang2⟩\ProvidesFile{lstlang2.sty}
82 ⟨+lang3⟩\ProvidesFile{lstlang3.sty}
83 ⟨+acm-prf⟩\ProvidesFile{listings-acm.prf}
84 ⟨+bash-prf⟩\ProvidesFile{listings-bash.prf}
85 ⟨+fortran-prf⟩\ProvidesFile{listings-fortran.prf}
86 ⟨+hansl-prf⟩\ProvidesFile{listings-hansl.prf}
```

4

```
87 ⟨+lua-prf⟩\ProvidesFile{listings-lua.prf}
88 ⟨+python-prf⟩\ProvidesFile{listings-python.prf}
89 ⟨-config⟩    [2023/02/27 1.9 listings language file]
```

2   Language drivers

2.1   Abap

Knut Lickert added support for Abap.[1]

```
90 ⟨*lang2⟩
```

```
91 %%
92 %% Abap definition by Knut Lickert
93 %%
```

There are some other new commands in release 6.10. They will follow later, but up to now I don't work with 6.10.

```
94 \lst@definelanguage[R/3 6.10]{ABAP}[R/3 4.6C]{ABAP}%
95   {morekeywords={try,endtry},%
96   }[keywords,comments,strings]
```

```
97 \lst@definelanguage[R/3 4.6C]{ABAP}[R/3 3.1]{ABAP}%
98   {morekeywords={method,ref,class,create,object,%
99       methods,endmethod,private,protected,public,section,%
100      catch,system-exceptions,endcatch,%
101      },%
102  moreprocnamekeys={class},%
103  literate={->}{{$\rightarrow$}}1{=>}{{$\Rightarrow$}}1,%
104  }[keywords,comments,strings,procnames]
```

Yes there are also some more releases in R/3 (2.1...), but I know them not really. So let's start with R/3 3.1.

```
105 \lst@definelanguage[R/3 3.1]{ABAP}[R/2 5.0]{ABAP}{}%
```

As I remember all this commands exists in R/2. Many commands are new in R/2 5.0 (compared with R/2 4.3). But as I am not using R/2 4.3 any more, I start with R/2 5.0.

```
106 \lst@definelanguage[R/2 5.0]{ABAP}{%
107  sensitive=f,%
108  procnamekeys={report,program,form,function,module},%
109  morekeywords={*, add, after, alias, analyzer, and, append, appending,%
110    area, assign, at, authority-check, before, binary, blank, break-point,%
111    calendar, call, case, change, changing, check, clear, cnt, co, collect,%
112    commit, common, component, compute, condense, corresponding, cos, cp,%
113    cs, currency-conversion, cursor, data, database, dataset, decimals,%
114    define, delete, deleting, dequeue, describe, detail, dialog, directory,%
115    div, divide, do, documentation, during, dynpro, else, end-of-page,%
116    end-of-selection, endat, endcase, enddo, endfor, endform, endif,%
117    endloop, endmodule, endselect, endwhile, enqueue, exceptions, exit,%
118    exp, export, exporting, extract, field, fields, field-groups,%
119    field-symbols, find, for, form, format, free, from, function,%
120    generating, get, giving, hide, id, if, import, importing, in, incl,%
121    include, initial, initialization, input, insert, interrupt, into, is,%
```

---

[1] In this section 'I' is Knut Lickert.

5

```
122    language, leave, leading, left-justified, like, line, lines,%
123    line-count, line-selection, list-processing, load, local, log, logfile,%
124    loop, margin, mark, mask, memory, menue, message, mod, modify, module,%
125    move, move-text, multiply, na, new, new-line, new-page, no-gaps, np,%
126    ns, number, obligatory, occurs, of, on, or, others, output, parameter,%
127    parameters, parts, perform, pf-status, places, position, process,%
128    raise, raising, ranges, read, refresh, refresh-dynpro, reject, remote,%
129    replace, report, reserve, reset, restart, right-justified, run, screen,%
130    scroll, search, segments, select, select-options, selection-screen,%
131    set, shift, sin, single, sqrt, start-of-selection, statement,%
132    structure, submit, subtract, summary, summing, suppress, system, table,%
133    tables, task, text, time, to, top-of-page, trace, transaction,%
134    transfer, transfer-dynpro, translate, type, unpack, update,%
135    user-command, using, value, when, where, while, window, with, workfile,%
136    write},%
137  morecomment=[l]",%
138  morecomment=[f][commentstyle][0]*,%
139  morestring=[d]'%
140 }[keywords,comments,strings,procnames]
```

This section for R/2 4.3 is not really maintained. It is just what I remember of the past.

```
141 \lst@definelanguage[R/2 4.3]{ABAP}[R/2 5.0]{ABAP}%
142   {deletekeywords={function,importing,exporting,changing,exceptions,%
143        raise,raising}%
144   }[keywords,comments,strings]
```

145 ⟨/lang2⟩

2.2   ACM

ACM is the language of the Aspen Custom Modeler (http://www.aspentech.com/products/aspen-custom-modeler.aspx), the language definition was provided by Stefan Pinnow. It is intended for writing models. Maximilian Dammann pointed out the missing keyword "Description".

146 ⟨*lang2⟩

```
147 %%
148 %% ACM and ACMscript definition
149 %% (c) 2013 Stefan Pinnow
150 %%
151 \lst@definelanguage{ACM}{%
152  morekeywords={ abs, After, acos, And, As, asin, atan, At, Call,%
153    Compatibility, Connect, cos, cosh, Create, Delay, Description,%
154    Difference, Do, Else, ElseIf, End, EndFor, EndIf, EndParallel,%
155    EndState, EndSwitch, EndText, EndWith, exp, External, Fixed, For,%
156    ForEach, Free, Global, Hidden, If, Implementation, In, Initial, Input,%
157    InterSection, IntegerSet, Invoke, Is, Language, Library, Link, Log10,%
158    LogE, Max, Min, Model, Of, Once, Options, Output, Parallel, Parameter,%
159    Pause, Port, Print, Private, Procedure, Product, Ramp, Repeat, Restart,%
160    Return, Round, Runs, Sigma, sin, sinh, Size, SnapShot, sqr, sqrt,%
161    SRamp, State, Stream, StringSet, Structure, Switch, SubRoutine,%
162    SymDiff, tan, tanh, Task, Text, Time, Then, Truncate, Union, Until,%
163    Uses, Variable, Wait, When, With, WithIn, WorkSpace},%
164  sensitive=false,%
```

```
165    morecomment=[l]{//},%
166    morecomment=[s]{/*}{*/},%
167    string=[b]{"},%
168  }[keywords,comments,strings]%
```

169 ⟨/lang2⟩

In addition to writing models there is a language ACMscript, which is similar to VBScript. According to Stefan Pinnow this language is used for writing scripts for the models.

170 ⟨∗lang2⟩

```
171  \lst@definelanguage{ACMscript}[]{VBScript}{%
172    morekeywords={%
173      ElseIf,False,In,Resume,True%
174    },%
175    deletekeywords={%
176      Abs,Array,Clear,CreateObject,CStr,Err,ForReading,ForWriting,%
177      OpenTextFile,Replace,WriteLine%
178    }%
179  }[keywords,comments,strings]%
```

180 ⟨/lang2⟩

Stefan Pinnow also supplied a definition of a style for printing ACM code:

181 ⟨∗acm-prf⟩

```
182  \usepackage[rgb, x11names]{xcolor}
183
184  \definecolor{Comments}{rgb}{0.00,0.50,0.00}
185  \definecolor{KeyWords}{rgb}{0.00,0.00,0.63}
186  \definecolor{Strings}{rgb}{0.84,0.00,0.00}
187
188  \lstdefinestyle{ACM}{%
189    basicstyle=\scriptsize\ttfamily,%
190    keywordstyle=\color{KeyWords},%
191    showstringspaces=false,%
192    identifierstyle=\color{black},%
193    commentstyle=\color{Comments},%
194    stringstyle=\color{Strings},%
195    frame=shadowbox,%             % for ACM-Code scrartcl commented out
196  %   frame=l,%                   % line on the left side
197    rulesepcolor=\color{black},%
198    numbers=left,%               % left
199    firstnumber=1,%
200    stepnumber=5,%
201    columns=fixed,%              % to prevent inserting spaces
202    fontadjust=true,%
203    basewidth=0.5em,%
204    captionpos=t,%
205    abovecaptionskip=\smallskipamount,% same amount as default
206    belowcaptionskip=\smallskipamount,% in caption package
207  }%
```

This code is provided in the file `listings-acm.prf`, see section 2.4.1 (Preferences) of the listings documentation.

208 ⟨/acm-prf⟩

2.3 ACSL

This language was provided by Andreas Matthias. I'm sorry for forgetting to add this language for a long time.

```
209 ⟨*lang1⟩
210 %%
211 %% ACSL definition (c) 2000 by Andreas Matthias
212 %%
213 \lst@definelanguage{ACSL}[90]{Fortran}%
214     {morekeywords={algorithm,cinterval,constant,derivative,discrete,%
215         dynamic,errtag,initial,interval,maxterval,minterval,%
216         merror,xerror,nsteps,procedural,save,schedule,sort,%
217         table,terminal,termt,variable},%
218     sensitive=false,%
219     morecomment=[l]!%
220     }[keywords, comments]%
221 ⟨/lang1⟩
```

2.4 Ada

Data come from

- BARNES, JOHN GILBERT PRESSLIE: **Programming in Ada plus language reference manual**; © 1991 Addison-Wesley Publishing Company, Inc.; ISBN 0-201-56539-0.

Torsten Neuer added support for Ada 95. I changed the definition to reduce the required string memory.

```
222 ⟨*lang1⟩
223 %%
224 %% Ada 95 definition (c) Torsten Neuer
225 %%
226 %% Ada 2005 definition (c) 2006 Santiago Urue\~{n}a Pascual
227 %%                              <Santiago.Uruena@upm.es>
228 %%
229 \lst@definelanguage[2005]{Ada}[95]{Ada}%
230    {morekeywords={interface,overriding,synchronized}}%
231 \lst@definelanguage[95]{Ada}[83]{Ada}%
232    {morekeywords={abstract,aliased,protected,requeue,tagged,until}}%
233 \lst@definelanguage[83]{Ada}%
234    {morekeywords={abort,abs,accept,access,all,and,array,at,begin,body,%
235        case,constant,declare,delay,delta,digits,do,else,elsif,end,entry,%
236        exception,exit,for,function,generic,goto,if,in,is,limited,loop,%
237        mod,new,not,null,of,or,others,out,package,pragma,private,%
238        procedure,raise,range,record,rem,renames,return,reverse,select,%
239        separate,subtype,task,terminate,then,type,use,when,while,with,%
240        xor},%
241    sensitive=f,%
242    morecomment=[l]--,%
243    morestring=[m]",% percent not defined as stringizer so far
244    morestring=[m]'%
245    }[keywords,comments,strings]%
246 ⟨/lang1⟩
```

2.5 Algol

Data come from

- UWE PAPE: **Programmieren in ALGOL 60**; © 1973 Carl Hanser Verlag München; ISBN 3-446-11605-2

- FRANK G. PAGAN: **A practical guide to ALGOL 68**; © 1976 by John Wiley & Sohn Ltd.; ISBN 0-471-65746-8 (Cloth); ISBN 0-471-65747-6 (Pbk).

The definition of Algol 68 doesn't support comments enclosed by ¢.

```
247 ⟨∗lang3⟩
248 \lst@definelanguage[68]{Algol}%
249 % ??? should 'i' be a keyword
250   {morekeywords={abs,and,arg,begin,bin,bits,bool,by,bytes,case,channel,%
251       char,co,comment,compl,conj,divab,do,down,elem,elif,else,empty,%
252       end,entier,eq,esac,exit,false,fi,file,flex,for,format,from,ge,%
253       goto,gt,heap,if,im,in,int,is,isnt,le,leng,level,loc,long,lt,lwb,%
254       minusab,mod,modab,mode,ne,nil,not,od,odd,of,op,or,ouse,out,over,%
255       overab,par,plusab,plusto,pr,pragmat,prio,proc,re,real,ref,repr,%
256       round,sema,shl,short,shorten,shr,sign,skip,string,struct,then,%
257       timesab,to,true,union,up,upb,void,while},%
258     sensitive=f,% ???
259     morecomment=[s]{\#}{\#},%
260     keywordcomment={co,comment}%
261   }[keywords,comments,keywordcomments]%

262 \lst@definelanguage[60]{Algol}%
263   {morekeywords={array,begin,Boolean,code,comment,div,do,else,end,%
264       false,for,goto,if,integer,label,own,power,procedure,real,step,%
265       string,switch,then,true,until,value,while},%
266     sensitive=f,% ???
267     keywordcommentsemicolon={end}{else,end}{comment}%
268   }[keywords,keywordcomments]%
269 ⟨/lang3⟩
```

2.6 Assembler

Credits go to Michael Franke.

```
270 ⟨∗lang3⟩
271 %%
272 %% Motorola 68K definition (c) 2006 Michael Franke
273 %%
274 \lst@definelanguage[Motorola68k]{Assembler}{%
275   morekeywords={ABCD,ADD,%
276     ADDA,ADDI,ADDQ,ADDX,AND,ANDI,ASL,ASR,BCC,BLS,BCS,BLT,BEQ,BMI,BF,BNE,%
277     BGE,BPL,BGT,BT,BHI,BVC,BLE,BVS,BCHG,BCLR,BRA,BSET,BSR,BTST,CHK,CLR,%
278     CMP,CMPA,CMPI,CMPM,DBCC,DBLS,DBCS,DBLT,DBEQ,DBMI,DBF,DBNE,DBGE,DBPL,%
279     DBGT,DBT,DBHI,DBVC,DBLE,DBVS,DIVS,DIVU,EOR,EORI,EXG,EXT,ILLEGAL,JMP,%
280     JSR,LEA,LINK,LSL,LSR,MOVE,MOVEA,MOVEM,MOVEP,MOVEQ,MULS,MULU,NBCD,NEG,%
281     NEGX,NOP,NOT,OR,ORI,PEA,RESET,ROL,ROR,ROXL,ROXR,RTE,RTR,RTS,SBCD,%
282     SCC,SLS,SCS,SLT,SEQ,SMI,SF,SNE,SGE,SPL,SGT,ST,SHI,SVC,SLE,SVS,STOP,%
283     SUB,SUBA,SUBI,SUBQ,SUBX,SWAP,TAS,TRAP,TRAPV,TST,UNLK},%
284     sensitive=false,%
```

```
285    morecomment=[l]*,%
286    morecomment=[l];%
287    }[keywords,comments,strings]
288 ⟨/lang3⟩
```

Credits go to Andrew Zabolotny.

```
289 ⟨*lang3⟩
290 %%
291 %% x86masm definition (c) 2002 Andrew Zabolotny
292 %%
293 \lst@definelanguage[x86masm]{Assembler}%
294    {morekeywords={al,ah,ax,eax,bl,bh,bx,ebx,cl,ch,cx,ecx,dl,dh,dx,edx,%
295        si,esi,di,edi,bp,ebp,sp,esp,cs,ds,es,ss,fs,gs,cr0,cr1,cr2,cr3,%
296        db0,db1,db2,db3,db4,db5,db6,db7,tr0,tr1,tr2,tr3,tr4,tr5,tr6,tr7,%
297        st,aaa,aad,aam,aas,adc,add,and,arpl,bound,bsf,bsr,bswap,bt,btc,%
298        btr,bts,call,cbw,cdq,clc,cld,cli,clts,cmc,cmp,cmps,cmpsb,cmpsw,%
299        cmpsd,cmpxchg,cwd,cwde,daa,das,dec,div,enter,hlt,idiv,imul,in,%
300        inc,ins,int,into,invd,invlpg,iret,ja,jae,jb,jbe,jc,jcxz,jecxz,%
301        je,jg,jge,jl,jle,jna,jnae,jnb,jnbe,jnc,jne,jng,jnge,jnl,jnle,%
302        jno,jnp,jns,jnz,jo,jp,jpe,jpo,js,jz,jmp,lahf,lar,lea,leave,lgdt,%
303        lidt,lldt,lmsw,lock,lods,lodsb,lodsw,lodsd,loop,loopz,loopnz,%
304        loope,loopne,lds,les,lfs,lgs,lss,lsl,ltr,mov,movs,movsb,movsw,%
305        movsd,movsx,movzx,mul,neg,nop,not,or,out,outs,pop,popa,popad,%
306        popf,popfd,push,pusha,pushad,pushf,pushfd,rcl,rcr,rep,repe,%
307        repne,repz,repnz,ret,retf,rol,ror,sahf,sal,sar,sbb,scas,seta,%
308        setae,setb,setbe,setc,sete,setg,setge,setl,setle,setna,setnae,%
309        setnb,setnbe,setnc,setne,setng,setnge,setnl,setnle,setno,setnp,%
310        setns,setnz,seto,setp,setpe,setpo,sets,setz,sgdt,shl,shld,shr,%
311        shrd,sidt,sldt,smsw,stc,std,sti,stos,stosb,stosw,stosd,str,sub,%
312        test,verr,verw,wait,wbinvd,xadd,xchg,xlatb,xor,fabs,fadd,fbld,%
313        fbstp,fchs,fclex,fcom,fcos,fdecstp,fdiv,fdivr,ffree,fiadd,ficom,%
314        fidiv,fidivr,fild,fimul,fincstp,finit,fist,fisub,fisubr,fld,fld1,%
315        fldl2e,fldl2t,fldlg2,fldln2,fldpi,fldz,fldcw,fldenv,fmul,fnop,%
316        fpatan,fprem,fprem1,fptan,frndint,frstor,fsave,fscale,fsetpm,%
317        fsin,fsincos,fsqrt,fst,fstcw,fstenv,fstsw,fsub,fsubr,ftst,fucom,%
318        fwait,fxam,fxch,fxtract,fyl2x,fyl2xp1,f2xm1},%
319    morekeywords=[2]{.align,.alpha,assume,byte,code,comm,comment,.const,%
320        .cref,.data,.data?,db,dd,df,dosseg,dq,dt,dw,dword,else,end,endif,%
321        endm,endp,ends,eq,equ,.err,.err1,.err2,.errb,.errdef,.errdif,%
322        .erre,.erridn,.errnb,.errndef,.errnz,event,exitm,extrn,far,%
323        .fardata,.fardata?,fword,ge,group,gt,high,if,if1,if2,ifb,ifdef,%
324        ifdif,ife,ifidn,ifnb,ifndef,include,includelib,irp,irpc,label,%
325        .lall,le,length,.lfcond,.list,local,low,lt,macro,mask,mod,.model,%
326        name,ne,near,offset,org,out,page,proc,ptr,public,purge,qword,.%
327        radix,record,rept,.sall,seg,segment,.seq,.sfcond,short,size,%
328        .stack,struc,subttl,tbyte,.tfcond,this,title,type,.type,width,%
329        word,.xall,.xcref,.xlist},%
330    alsoletter=.,alsodigit=?,%
331    sensitive=f,%
332    morestring=[b]",%
333    morestring=[b]',%
334    morecomment=[l];%
335    }[keywords,comments,strings]
336 ⟨/lang3⟩
```

2.7 Awk

Thanks to Dr. Christoph Giess for providing these definitions.

```
337 ⟨*lang1⟩
338 %%
339 %% awk definitions (c) Christoph Giess
340 %%
341 \lst@definelanguage[gnu]{Awk}[POSIX]{Awk}%
342   {morekeywords={and,asort,bindtextdomain,compl,dcgettext,gensub,%
343       lshift,mktime,or,rshift,strftime,strtonum,systime,xor,extension}%
344   }%
345 \lst@definelanguage[POSIX]{Awk}%
346   {keywords={BEGIN,END,close,getline,next,nextfile,print,printf,%
347       system,fflush,atan2,cos,exp,int,log,rand,sin,sqrt,srand,gsub,%
348       index,length,match,split,sprintf,strtonum,sub,substr,tolower,%
349       toupper,if,while,do,for,break,continue,delete,exit,function,%
350       return},%
351   sensitive,%
352   morecomment=[l]\#,%
353   morecomment=[l]//,%
354   morecomment=[s]{/*}{*/},%
355   morestring=[b]"%
356   }[keywords,comments,strings]%
357 ⟨/lang1⟩
```

2.8 Basic

Credits go to Robert Frank.

```
358 ⟨*lang1⟩
359 %%
360 %% Visual Basic definition (c) 2002 Robert Frank
361 %%
362 \lst@definelanguage[Visual]{Basic}
363   {morekeywords={Abs,Array,Asc,AscB,AscW,Atn,Avg,CBool,CByte,CCur,%
364       CDate,CDbl,Cdec,Choose,Chr,ChrB,ChrW,CInt,CLng,Command,Cos,%
365       Count,CreateObject,CSng,CStr,CurDir,CVar,CVDate,CVErr,Date,%
366       DateAdd,DateDiff,DatePart,DateSerial,DateValue,Day,DDB,Dir,%
367       DoEvents,Environ,EOF,Error,Exp,FileAttr,FileDateTime,FileLen,%
368       Fix,Format,FreeFile,FV,GetAllStrings,GetAttr,%
369       GetAutoServerSettings,GetObject,GetSetting,Hex,Hour,IIf,%
370       IMEStatus,Input,InputB,InputBox,InStr,InstB,Int,Integer,IPmt,%
371       IsArray,IsDate,IsEmpty,IsError,IsMissing,IsNull,IsNumeric,%
372       IsObject,LBound,LCase,Left,LeftB,Len,LenB,LoadPicture,Loc,LOF,%
373       Log,Ltrim,Max,Mid,MidB,Min,Minute,MIRR,Month,MsgBox,Now,NPer,%
374       NPV,Oct,Partition,Pmt,PPmt,PV,QBColor,Rate,RGB,Right,RightB,Rnd,%
375       Rtrim,Second,Seek,Sgn,Shell,Sin,SLN,Space,Spc,Sqr,StDev,StDevP,%
376       Str,StrComp,StrConv,String,Switch,Sum,SYD,Tab,Tan,Time,Timer,%
377       TimeSerial,TimeValue,Trim,TypeName,UBound,Ucase,Val,Var,VarP,%
378       VarType,Weekday,Year},% functions
379   morekeywords=[2]{Accept,Activate,Add,AddCustom,AddFile,AddFromFile,%
380       AddFromTemplate,AddItem,AddNew,AddToAddInToolbar,%
381       AddToolboxProgID,Append,AppendChunk,Arrange,Assert,AsyncRead,%
382       BatchUpdate,BeginTrans,Bind,Cancel,CancelAsyncRead,CancelBatch,%
```

```
383        CancelUpdate,CanPropertyChange,CaptureImage,CellText,CellValue,%
384        Circle,Clear,ClearFields,ClearSel,ClearSelCols,Clone,Close,Cls,%
385        ColContaining,ColumnSize,CommitTrans,CompactDatabase,Compose,%
386        Connect,Copy,CopyQueryDef,CreateDatabase,CreateDragImage,%
387        CreateEmbed,CreateField,CreateGroup,CreateIndex,CreateLink,%
388        CreatePreparedStatement,CreatePropery,CreateQuery,%
389        CreateQueryDef,CreateRelation,CreateTableDef,CreateUser,%
390        CreateWorkspace,Customize,Delete,DeleteColumnLabels,%
391        DeleteColumns,DeleteRowLabels,DeleteRows,DoVerb,Drag,Draw,Edit,%
392        EditCopy,EditPaste,EndDoc,EnsureVisible,EstablishConnection,%
393        Execute,ExtractIcon,Fetch,FetchVerbs,Files,FillCache,Find,%
394        FindFirst,FindItem,FindLast,FindNext,FindPrevious,Forward,%
395        GetBookmark,GetChunk,GetClipString,GetData,GetFirstVisible,%
396        GetFormat,GetHeader,GetLineFromChar,GetNumTicks,GetRows,%
397        GetSelectedPart,GetText,GetVisibleCount,GoBack,GoForward,Hide,%
398        HitTest,HoldFields,Idle,InitializeLabels,InsertColumnLabels,%
399        InsertColumns,InsertObjDlg,InsertRowLabels,InsertRows,Item,%
400        KillDoc,Layout,Line,LinkExecute,LinkPoke,LinkRequest,LinkSend,%
401        Listen,LoadFile,LoadResData,LoadResPicture,LoadResString,%
402        LogEvent,MakeCompileFile,MakeReplica,MoreResults,Move,MoveData,%
403        MoveFirst,MoveLast,MoveNext,MovePrevious,NavigateTo,NewPage,%
404        NewPassword,NextRecordset,OLEDrag,OnAddinsUpdate,OnConnection,%
405        OnDisconnection,OnStartupComplete,Open,OpenConnection,%
406        OpenDatabase,OpenQueryDef,OpenRecordset,OpenResultset,OpenURL,%
407        Overlay,PaintPicture,Paste,PastSpecialDlg,PeekData,Play,Point,%
408        PopulatePartial,PopupMenu,Print,PrintForm,PropertyChanged,Pset,%
409        Quit,Raise,RandomDataFill,RandomFillColumns,RandomFillRows,%
410        rdoCreateEnvironment,rdoRegisterDataSource,ReadFromFile,%
411        ReadProperty,Rebind,ReFill,Refresh,RefreshLink,RegisterDatabase,%
412        Reload,Remove,RemoveAddInFromToolbar,RemoveItem,Render,%
413        RepairDatabase,Reply,ReplyAll,Requery,ResetCustom,%
414        ResetCustomLabel,ResolveName,RestoreToolbar,Resync,Rollback,%
415        RollbackTrans,RowBookmark,RowContaining,RowTop,Save,SaveAs,%
416        SaveFile,SaveToFile,SaveToolbar,SaveToOle1File,Scale,ScaleX,%
417        ScaleY,Scroll,Select,SelectAll,SelectPart,SelPrint,Send,%
418        SendData,Set,SetAutoServerSettings,SetData,SetFocus,SetOption,%
419        SetSize,SetText,SetViewport,Show,ShowColor,ShowFont,ShowHelp,%
420        ShowOpen,ShowPrinter,ShowSave,ShowWhatsThis,SignOff,SignOn,Size,%
421        Span,SplitContaining,StartLabelEdit,StartLogging,Stop,%
422        Synchronize,TextHeight,TextWidth,ToDefaults,TwipsToChartPart,%
423        TypeByChartType,Update,UpdateControls,UpdateRecord,UpdateRow,%
424        Upto,WhatsThisMode,WriteProperty,ZOrder},% methods
425    morekeywords=[3]{AccessKeyPress,AfterAddFile,AfterChangeFileName,%
426        AfterCloseFile,AfterColEdit,AfterColUpdate,AfterDelete,%
427        AfterInsert,AfterLabelEdit,AfterRemoveFile,AfterUpdate,%
428        AfterWriteFile,AmbienChanged,ApplyChanges,Associate,%
429        AsyncReadComplete,AxisActivated,AxisLabelActivated,%
430        AxisLabelSelected,AxisLabelUpdated,AxisSelected,%
431        AxisTitleActivated,AxisTitleSelected,AxisTitleUpdated,%
432        AxisUpdated,BeforeClick,BeforeColEdit,BeforeColUpdate,%
433        BeforeConnect,BeforeDelete,BeforeInsert,BeforeLabelEdit,%
434        BeforeLoadFile,BeforeUpdate,ButtonClick,ButtonCompleted,%
435        ButtonGotFocus,ButtonLostFocus,Change,ChartActivated,%
436        ChartSelected,ChartUpdated,Click,ColEdit,Collapse,ColResize,%
```

```
437        ColumnClick,Compare,ConfigChageCancelled,ConfigChanged,%
438        ConnectionRequest,DataArrival,DataChanged,DataUpdated,DblClick,%
439        Deactivate,DeviceArrival,DeviceOtherEvent,DeviceQueryRemove,%
440        DeviceQueryRemoveFailed,DeviceRemoveComplete,DeviceRemovePending,%
441        DevModeChange,Disconnect,DisplayChanged,Dissociate,%
442        DoGetNewFileName,Done,DonePainting,DownClick,DragDrop,DragOver,%
443        DropDown,EditProperty,EnterCell,EnterFocus,Event,ExitFocus,%
444        Expand,FootnoteActivated,FootnoteSelected,FootnoteUpdated,%
445        GotFocus,HeadClick,InfoMessage,Initialize,IniProperties,%
446        ItemActivated,ItemAdded,ItemCheck,ItemClick,ItemReloaded,%
447        ItemRemoved,ItemRenamed,ItemSeletected,KeyDown,KeyPress,KeyUp,%
448        LeaveCell,LegendActivated,LegendSelected,LegendUpdated,%
449        LinkClose,LinkError,LinkNotify,LinkOpen,Load,LostFocus,%
450        MouseDown,MouseMove,MouseUp,NodeClick,ObjectMove,%
451        OLECompleteDrag,OLEDragDrop,OLEDragOver,OLEGiveFeedback,%
452        OLESetData,OLEStartDrag,OnAddNew,OnComm,Paint,PanelClick,%
453        PanelDblClick,PathChange,PatternChange,PlotActivated,%
454        PlotSelected,PlotUpdated,PointActivated,PointLabelActivated,%
455        PointLabelSelected,PointLabelUpdated,PointSelected,%
456        PointUpdated,PowerQuerySuspend,PowerResume,PowerStatusChanged,%
457        PowerSuspend,QueryChangeConfig,QueryComplete,QueryCompleted,%
458        QueryTimeout,QueryUnload,ReadProperties,Reposition,%
459        RequestChangeFileName,RequestWriteFile,Resize,ResultsChanged,%
460        RowColChange,RowCurrencyChange,RowResize,RowStatusChanged,%
461        SelChange,SelectionChanged,SendComplete,SendProgress,%
462        SeriesActivated,SeriesSelected,SeriesUpdated,SettingChanged,%
463        SplitChange,StateChanged,StatusUpdate,SysColorsChanged,%
464        Terminate,TimeChanged,TitleActivated,TitleSelected,%
465        TitleActivated,UnboundAddData,UnboundDeleteRow,%
466        UnboundGetRelativeBookmark,UnboundReadData,UnboundWriteData,%
467        Unload,UpClick,Updated,Validate,ValidationError,WillAssociate,%
468        WillChangeData,WillDissociate,WillExecute,WillUpdateRows,%
469        WithEvents,WriteProperties},% VB-events
470     morekeywords=[4]{AppActivate,Base,Beep,Call,Case,ChDir,ChDrive,%
471        Const,Declare,DefBool,DefByte,DefCur,DefDate,DefDbl,DefDec,%
472        DefInt,DefLng,DefObj,DefSng,DefStr,Deftype,DefVar,DeleteSetting,%
473        Dim,Do,Else,ElseIf,End,Enum,Erase,Event,Exit,Explicit,FileCopy,%
474        For,ForEach,Friend,Function,Get,GoSub,GoTo,If,Implements,Kill,%
475        Let,LineInput,Lock,Lset,MkDir,Name,Next,OnError,On,Option,%
476        Private,Property,Public,Put,RaiseEvent,Randomize,ReDim,Rem,%
477        Reset,Resume,Return,RmDir,Rset,SavePicture,SaveSetting,%
478        SendKeys,SetAttr,Static,Sub,Then,Type,Unlock,Wend,While,Width,%
479        With,Write},% statements
480     sensitive=false,%
481     keywordcomment=rem,%
482     MoreSelectCharTable=\def\lst@BeginKC@{% chmod
483        \lst@ResetToken
484        \lst@BeginComment\lst@GPmode{{\lst@commentstyle}%
485                    \lst@Lmodetrue\lst@modetrue}\@empty},%
486     morecomment=[l]{'},%
487     morecomment=[s]{/*}{*/},%
488     morestring=[b]",%
489     }[keywords,comments,strings,keywordcomments]
490 ⟨/lang1⟩
```

Thanks to Jonathan de Halleux for reporting a missing comma after `MoreSelectCharTable`, which was the cause of a problem reported by Robert Frank. Martina Hansel also found the bug and the fix.

2.9 Clean

Thanks to José Romildo Malaquias. Markus Pahlow found a missing comma.

```
491 ⟨∗lang3⟩
492 %%
493 %% Clean definition (c) 1999 Jos\'e Romildo Malaquias
494 %%
495 %% Clean 1.3 :  some standard functional language: pure, lazy,
496 %%              polymorphic type system, modules, type classes,
497 %%              garbage collection, functions as first class citizens
498 %%
499 \lst@definelanguage{Clean}%
500   {otherkeywords={:,::,=,:==,=:,=>,->,<-,<-:,\{,\},\{|,|\},\#,\#!,|,\&,%
501       [,],!,.,\\\\,;,_},%
502   morekeywords={from,definition,implementation,import,module,system,%
503       case,code,if,in,let,let!,of,where,with,infix,infixl,infixr},%
504   morendkeywords={True,False,Start,Int,Real,Char,Bool,String,World,%
505       File,ProcId},%
506   sensitive,%
507   morecomment=[l]//,% missing comma: Markus Pahlow
508   morecomment=[n]{/*}{*/},%
509   morestring=[b]"%
510   }[keywords,comments,strings]%
511 ⟨/lang3⟩
```

2.10 Corba IDL

This language definition is due to Jens T. Berger Thielemann.

```
512 ⟨∗lang2⟩
513 %%
514 %% Corba IDL definition (c) 1999 Jens T. Berger Thielemann
515 %%
516 \lst@definelanguage[CORBA]{IDL}%
517   {morekeywords={any,attribute,boolean,case,char,const,context,default,%
518       double,enum,exception,fixed,float,in,inout,interface,long,module,%
519       native,Object,octet,oneway,out,raises,readonly,sequence,short,%
520       string,struct,switch,typedef,union,unsigned,void,wchar,wstring,%
521       FALSE,TRUE},%
522   sensitive,%
523   moredirectives={define,elif,else,endif,error,if,ifdef,ifndef,line,%
524       include,pragma,undef,warning},%
525   moredelim=*[directive]\#,%
526   morecomment=[l]//,%
527   morecomment=[s]{/*}{*/},%
528   morestring=[b]"%
529   }[keywords,comments,strings,directives]%
530 ⟨/lang2⟩
```

2.11   C, C++, et al

531 ⟨∗lang1⟩

Michael Fiedler provided the following list of new introduced keywords for C++11.

```
532 \lst@definelanguage[11]{C++}[ISO]{C++}%
533   {morekeywords={alignas,alignof,char16_t,char32_t,constexpr,%
534       decltype,noexcept,nullptr,static_assert,thread_local},%
535   }%
```

Michael Piefel suggested some more changes and added GNU C++. For compatibility the 'ANSI' language is defined in terms of ISO.

```
536 \lst@definelanguage[ANSI]{C++}[ISO]{C++}{}%
```

Michael Piefel suggested some more changes and added GNU C++.

```
537 \lst@definelanguage[GNU]{C++}[ISO]{C++}%
538   {morekeywords={__attribute__,__extension__,__restrict,__restrict__,%
539       typeof,__typeof__},%
540   }%
541 \lst@definelanguage[Visual]{C++}[ISO]{C++}%
542   {morekeywords={__asm,__based,__cdecl,__declspec,dllexport,%
543       dllimport,__except,__fastcall,__finally,__inline,__int8,__int16,%
544       __int32,__int64,naked,__stdcall,thread,__try,__leave},%
545   }%
546 \lst@definelanguage[ISO]{C++}[ANSI]{C}%
547   {morekeywords={and,and_eq,asm,bad_cast,bad_typeid,bitand,bitor,bool,%
548       catch,class,compl,const_cast,delete,dynamic_cast,explicit,export,%
549       false,friend,inline,mutable,namespace,new,not,not_eq,operator,or,%
550       or_eq,private,protected,public,reinterpret_cast,static_cast,%
551       template,this,throw,true,try,typeid,type_info,typename,using,%
552       virtual,wchar_t,xor,xor_eq},%
553   }%
```

554 ⟨/lang1⟩

Objective-C is due to Detlev Dröge.

555 ⟨∗lang1⟩

```
556 %%
557 %% Objective-C definition (c) 1997 Detlev Droege
558 %%
559 \lst@definelanguage[Objective]{C}[ANSI]{C}
560   {morekeywords={bycopy,id,in,inout,oneway,out,self,super,%
561       @class,@defs,@encode,@end,@implementation,@interface,@private,%
562       @protected,@protocol,@public,@selector},%
563    moredirectives={import}%
564   }%
```

565 ⟨/lang1⟩

Jörg Viermann provided the keywords for Handel-C.

566 ⟨∗lang1⟩

```
567 %%
568 %% Handel-C definition, refer http://www.celoxica.com
569 %%
570 \lst@definelanguage[Handel]{C}[ANSI]{C}
571   {morekeywords={assert,chan,chanin,chanout,clock,delay,expr,external,%
```

```
572        external_divide,family,ifselect,in,inline,interface,internal,%
573        internal_divid,intwidth,let,macro,mpram,par,part,prialt,proc,ram,%
574        releasesema,reset,rom,select,sema,set,seq,shared,signal,try,%
575        reset,trysema,typeof,undefined,width,with,wom},%
576    }%
```

577 ⟨/lang1⟩

578 ⟨∗lang1⟩

```
579 \lst@definelanguage[ANSI]{C}%
580    {morekeywords={auto,break,case,char,const,continue,default,do,double,%
581        else,enum,extern,float,for,goto,if,int,long,register,return,%
582        short,signed,sizeof,static,struct,switch,typedef,union,unsigned,%
583        void,volatile,while},%
584    sensitive,%
585    morecomment=[s]{/*}{*/},%
586    morecomment=[l]//,% nonstandard
587    morestring=[b]",%
588    morestring=[b]',%
589    moredelim=*[directive]\#,%
590    moredirectives={define,elif,else,endif,error,if,ifdef,ifndef,line,%
591        include,pragma,undef,warning}%
592    }[keywords,comments,strings,directives]%
```

593 ⟨/lang1⟩

594 ⟨∗lang1⟩

Thanks go to Martin Brodbeck.

```
595 %%
596 %% C-Sharp definition (c) 2002 Martin Brodbeck
597 %%
598 \lst@definelanguage[Sharp]{C}%
599    {morekeywords={abstract,base,bool,break,byte,case,catch,char,checked,%
600        class,const,continue,decimal,default,delegate,do,double,else,%
601        enum,event,explicit,extern,false,finally,fixed,float,for,foreach,%
602        goto,if,implicit,in,int,interface,internal,is,lock,long,%
603        namespace,new,null,object,operator,out,override,params,private,%
604        protected,public,readonly,ref,return,sbyte,sealed,short,sizeof,%
605        static,string,struct,switch,this,throw,true,try,typeof,uint,%
606        ulong,unchecked,unsafe,ushort,using,virtual,void,while,%
607        as,volatile,stackalloc},% Kai K\"ohne
608    sensitive,%
609    morecomment=[s]{/*}{*/},%
610    morecomment=[l]//,%
611    morestring=[b]"
612    }[keywords,comments,strings]%
```

613 ⟨/lang1⟩

2.12   Caml and Objective Caml

Patrick Cousot mailed me the definition. Tom Hirschowitz added two keywords.

614 ⟨∗lang2⟩

```
615 %%
616 %% (Objective) Caml definition (c) 1999 Patrick Cousot
```

16

```
617 %%
618 %% Objective CAML and Caml light are freely available, together with a
619 %% reference manual, at URL ftp.inria.fr/lang/caml-light for the Unix,
620 %% Windows and Macintosh OS operating systems.
621 %%
622 \lst@definelanguage[Objective]{Caml}[light]{Caml}
623   {deletekeywords={not,prefix,value,where},%
624   morekeywords={assert,asr,class,closed,constraint,external,false,%
625       functor,include,inherit,land,lazy,lor,lsl,lsr,lxor,method,mod,%
626       module,new,open,parser,private,sig,struct,true,val,virtual,when,%
627       object,ref},% TH
628   }%
629 \lst@definelanguage[light]{Caml}
630   {morekeywords={and,as,begin,do,done,downto,else,end,exception,for,%
631       fun,function,if,in,let,match,mutable,not,of,or,prefix,rec,then,%
632       to,try,type,value,where,while,with},%
633   sensitive,%
634   morecomment=[n]{(*}{*)},%
635   morestring=[b]",%
636   moredelim=*[directive]\#,%
637   moredirectives={open,close,include}%
638   }[keywords,comments,strings,directives]%
639 ⟨/lang2⟩
```

2.13 Common Intermediate Language

This language definition for CIL (Common Intermediate Language, part of Microsoft's .NET interface) was provided by Olaf Conradi Akim Demaille pointed out that the support for Algol was broken, but that came from a long missing '@' in the following lst@definelanguage.

```
640 ⟨*lang3⟩
641 \lst@definelanguage{CIL}{%
642   morekeywords=[1]{assembly, beforefieldinit, class, default, cdecl, cil,%
643     corflags, culture, custom, data, entrypoint, fastcall, field, file,%
644     hidebysig, hash, il, imagebase, locals, managed, marshall, maxstack,%
645     mresource, method, module, namespace, publickey, stdcall, subsystem,%
646     thiscall, unmanaged, vararg, ver, vtfixup,%
647     % types
648     bool, char, float32, float64, int, int8, int16, int32, int64, method,%
649     native, object, string, modopt, modreq, pinned, typedref, valuetype,%
650     unsigned, void,%
651     % defining types
652     abstract, ansi, auto, autochar, beforefieldinit, boxed, class,%
653     explicit, extends, implements, interface, famandassem, family,%
654     famorassem, inherits, nested, override, pack, private, property,%
655     public, rtspecialname, sealed, sequential, serializable, size,%
656     specialname, static, unicode,%
657     % postfix
658     algorithm, alignment, extern, init, from, nometadata, with},%
659   morekeywords=[2]{add, and, arglist, beq, bge, bgt, ble, blt, bne, br,%
660     break, brfalse, brtrue, call, calli, ceq, cgt, ckfinite, clt, conv,%
661     cpblk, div, dup, endfilter, endfinally, initblk, jmp, ldarg, ldarga,%
```

17

```
662    ldc, ldftn, ldind, ldloc, ldloca, ldnull, leave, localloc, mul, neg,%
663    nop, not, or, pop, rem, ret, shl, shr, starg, stind, stloc, sub,%
664    switch, xor,%
665    % prefix
666    tail, unaligned, volatile,
667    % postfix
668    un, s, ovf,
669    % object
670    box, callvirt, castclass, cpobj, cctor, ctor, initobj, isinst, ldelem,%
671    ldelema, ldfld, ldflda, ldlen, ldobj, ldsfld, ldsflda, ldstr, ldtoken,%
672    ldvirtftn, mkrefany, newarr, newobj, refanytype, refanyval, rethrow,%
673    sizeof, stelem, stfld, stobj, stsfld, throw, unbox},%
674  sensitive=true,%
675  morecomment=[l]{//},%
676  morestring=[b]"%
677 }[keywords,comments,strings]%

678 ⟨/lang3⟩
```

2.14   Cobol

Keywords are not marked if their names are broken by EOL, for example DEBUG-CONTENTS. Sometimes portions of a string are not printed as a string. This happens if the double quote is not doubled to insert a quote, e.g. `""bad" cobol"` won't be printed correctly.

```
679 ⟨*lang2⟩

680 \lst@definelanguage[ibm]{Cobol}[1985]{Cobol}%
681    {morekeywords={ADDRESS,BEGINNING,COMP-3,COMP-4,COMPUTATIONAL,%
682        COMPUTATIONAL-3,COMPUTATIONAL-4,DISPLAY-1,EGCS,EJECT,ENDING,%
683        ENTRY,GOBACK,ID,MORE-LABELS,NULL,NULLS,PASSWORD,RECORDING,%
684        RETURN-CODE,SERVICE,SKIP1,SKIP2,SKIP3,SORT-CONTROL,SORT-RETURN,%
685        SUPPRESS,TITLE,WHEN-COMPILED},%
686    }%

687 \lst@definelanguage[1985]{Cobol}[1974]{Cobol}%
688    {morekeywords={ALPHABET,ALPHABETIC-LOWER,ALPHABETIC-UPPER,%
689        ALPHANUMERIC,ALPHANUMERIC-EDITED,ANY,CLASS,COMMON,CONTENT,%
690        CONTINUE,DAY-OF-WEEK,END-ADD,END-CALL,END-COMPUTE,END-DELETE,%
691        END-DIVIDE,END-EVALUATE,END-IF,END-MULTIPLY,END-PERFORM,END-READ,%
692        END-RECEIVE,END-RETURN,END-REWRITE,END-SEARCH,END-START,%
693        END-STRING,END-SUBTRACT,END-UNSTRING,END-WRITE,EVALUATE,EXTERNAL,%
694        FALSE,GLOBAL,INITIALIZE,NUMERIC-EDITED,ORDER,OTHER,%
695        PACKED-DECIMAL,PADDING,PURGE,REFERENCE,RELOAD,REPLACE,STANDARD-1,%
696        STANDARD-2,TEST,THEN,TRUE},%
697    }%

698 \lst@definelanguage[1974]{Cobol}%
699    {morekeywords={ACCEPT,ACCESS,ADD,ADVANCING,AFTER,ALL,ALPHABETIC,ALSO,%
700        ALTER,ALTERNATE,AND,ARE,AREA,AREAS,ASCENDING,ASSIGN,AT,AUTHOR,%
701        BEFORE,BINARY,BLANK,BLOCK,BOTTOM,BY,CALL,CANCEL,CD,CF,CH,%
702        CHARACTER,CHARACTERS,CLOCK-UNITS,CLOSE,COBOL,CODE,CODE-SET,%
703        COLLATING,COLUMN,COMMA,COMMUNICATION,COMP,COMPUTE,CONFIGURATION,%
704        CONTAINS,CONTROL,CONTROLS,CONVERTING,COPY,CORR,CORRESPONDING,%
705        COUNT,CURRENCY,DATA,DATE,DATE-COMPILED,DATE-WRITTEN,DAY,DE,%
706        DEBUG-CONTENTS,DEGUB-ITEM,DEBUG-LINE,DEBUG-NAME,DEBUG-SUB1,%
```

```
707      DEBUG-SUB2,DEBUG-SUB3,DEBUGGING,DECIMAL-POINT,DECLARATIVES,%
708      DELETE,DELIMITED,DELIMITER,DEPENDING,DESCENDING,DESTINATION,%
709      DETAIL,DISABLE,DISPLAY,DIVIDE,DIVISION,DOWN,DUPLICATES,DYNAMIC,%
710      EGI,ELSE,EMI,ENABLE,END,END-OF-PAGE,ENTER,ENVIRONMENT,EOP,EQUAL,%
711      ERROR,ESI,EVERY,EXCEPTION,EXIT,EXTEND,FD,FILE,FILE-CONTROL,%
712      FILLER,FINAL,FIRST,FOOTING,FOR,FROM,GENERATE,GIVING,GO,GREATER,%
713      GROUP,HEADING,HIGH-VALUE,HIGH-VALUES,I-O,I-O-CONTROL,%
714      IDENTIFICATION,IF,IN,INDEX,INDEXED,INDICATE,INITIAL,INITIATE,%
715      INPUT,INPUT-OUTPUT,INSPECT,INSTALLATION,INTO,INVALID,IS,JUST,%
716      JUSTIFIED,KEY,LABEL,LAST,LEADING,LEFT,LENGTH,LESS,LIMIT,LIMITS,%
717      LINAGE,LINAGE-COUNTER,LINE,LINE-COUNTER,LINES,LINKAGE,LOCK,%
718      LOW-VALUE,LOW-VALUES,MEMORY,MERGE,MESSAGE,MODE,MODULES,MOVE,%
719      MULTIPLE,MULTIPLY,NATIVE,NEGATIVE,NEXT,NO,NOT,NUMBER,NUMERIC,%
720      OBJECT-COMPUTER,OCCURS,OF,OFF,OMITTED,ON,OPEN,OPTIONAL,OR,%
721      ORGANIZATION,OUTPUT,OVERFLOW,PAGE,PAGE-COUNTER,PERFORM,PF,PH,PIC,%
722      PICTURE,PLUS,POINTER,POSITION,PRINTING,POSITIVE,PRINTING,%
723      PROCEDURE,PROCEDURES,PROCEED,PROGRAM,PROGRAM-ID,QUEUE,QUOTE,%
724      QUOTES,RANDOM,RD,READ,RECEIVE,RECORD,RECORDING,RECORDS,REDEFINES,%
725      REEL,REFERENCES,RELATIVE,RELEASE,REMAINDER,REMOVAL,RENAMES,%
726      REPLACING,REPORT,REPORTING,REPORTS,RERUN,RESERVE,RESET,RETURN,%
727      REVERSED,REWIND,REWRITE,RF,RH,RIGHT,ROUNDED,RUN,SAME,SD,SEARCH,%
728      SECTION,SECURITY,SEGMENT,SEGMENT-LIMIT,SELECT,SEND,SENTENCE,%
729      SEPARATE,SEQUENCE,SEQUENTIAL,SET,SIGN,SIZE,SORT,SORT-MERGE,%
730      SOURCE,SOURCE-COMPUTER,SPACE,SPACES,SPECIAL-NAMES,STANDARD,START,%
731      STATUS,STOP,STRING,SUB-QUEUE-1,SUB-QUEUE-2,SUB-QUEUE-3,SUBTRACT,%
732      SUM,SYMBOLIC,SYNC,SYNCHRONIZED,TABLE,TALLYING,TAPE,TERMINAL,%
733      TERMINATE,TEXT,THAN,THROUGH,THRU,TIME,TIMES,TO,TOP,TRAILING,TYPE,%
734      UNIT,UNSTRING,UNTIL,UP,UPON,USAGE,USE,USING,VALUE,VALUES,VARYING,%
735      WHEN,WITH,WORDS,WORKING-STORAGE,WRITE,ZERO,ZEROES,ZEROS},%
736   alsodigit=-,%
737   sensitive=f,% ???
738   morecomment=[f][commentstyle][6]*,%
739   morestring=[d]"% ??? doubled
740   }[keywords,comments,strings]%
```

`commentstyle` (not the surrounding brackets) have been added after a bug report by Stephen Reindl.

```
741 ⟨/lang2⟩
```

2.15   Comal 80

The data is from

- BORGE R. CHRISTENSEN: **Strukturierte Programmierung mit CO-MAL 80** [aus dem Dänischen übertragen und bearbeitet von Margarete Kragh]; 2., verb. Auflage – München; Wien: Oldenburg, 1985; ISBN 3-486-26902-X.

```
742 ⟨*lang3⟩

743 \lst@definelanguage{Comal 80}%
744   {morekeywords={AND,AUTO,CASE,DATA,DEL,DIM,DIV,DO,ELSE,ENDCASE,ENDIF,%
745       ENDPROC,ENDWHILE,EOD,EXEC,FALSE,FOR,GOTO,IF,INPUT,INT,LIST,LOAD,%
746       MOD,NEW,NEXT,NOT,OF,OR,PRINT,PROC,RANDOM,RENUM,REPEAT,RND,RUN,%
747       SAVE,SELECT,STOP,TAB,THEN,TRUE,UNTIL,WHILE,ZONE},%
```

19

```
748    sensitive=f,% ???
749    morecomment=[l]//,%
750    morestring=[d]"%
751    }[keywords,comments,strings]%
```

752 ⟨/lang3⟩

2.16   COMMAND.COM Batch Files

This definition for DOS and Windows batch files is from Stephan Hennig.

753 ⟨*lang3⟩

```
754 \lst@definelanguage[WinXP]{command.com}%
755    {morekeywords={assoc,at,attrib,bootcfg,break,cacls,call,cd,chcp,chdir,%
756        chkdsk,chkntfs,cls,cmd,cmdextversion,color,comp,compact,convert,copy,%
757        date,defined,del,dir,diskcomp,diskcopy,do,doskey,echo,else,endlocal,%
758        erase,errorlevel,exist,exit,fc,find,findstr,for,format,ftype,goto,%
759        graftabl,help,if,in,label,md,mkdir,mode,more,move,not,off,path,%
760        pause,popd,print,prompt,pushd,rd,recover,ren,rename,replace,rmdir,%
761        set,setlocal,shift,sort,start,subst,time,title,tree,type,ver,%
762        verify,vol,xcopy},%
763    sensitive=false,%
764    alsoother={@},%
765    alsoletter={\%~:-/},%
766    morecomment=[l]{rem},%
767    morecomment=[l]{reM},%
768    morecomment=[l]{rEm},%
769    morecomment=[l]{rEM},%
770    morecomment=[l]{Rem},%
771    morecomment=[l]{ReM},%
772    morecomment=[l]{REm},%
773    morecomment=[l]{REM},%
774    morestring=[d]"%
775 }[keywords,comments,strings]%
```

776 ⟨/lang3⟩

2.17   Comsol Multiphysics

Comsol Multiphysics (Prior to version 3.2 known as Femlab) can be used standalone or as an extension to MatLab. This definition is due to Martin Heller.

Unfortunately, there is a conflict in that Comsol is case-insensitive, whereas Matlab is case-sensitive; listings does not currently support different case-sensitivities in the same listing.

777 ⟨*lang3⟩

```
778 \lst@definelanguage{Comsol}%
779    {morekeywords={%
780        adaption,arc1,arc2,arrayr,assemble,asseminit,beziercurve2,block2,%
781        block3,bsplinecurve2,bsplinecurve3,bsplinesurf3,bypassplot,cardg,%
782        ccoeffgroup,chamfer,checkgeom,circ1,circ2,coeff2cell,comsol,%
783        cone2,cone3,Contents,createhexes,createprisms,createquads,csgbl2,%
784        csgbl3,csgcmpbz,csgimplbz,csginitaux,csginitnr,csgproputil,%
785        csgrbconv,csgunique3,csguniquep,csgversion,csgvvovl,curve2,%
786        curve3,cylinder2,cylinder3,dat2str,defastget,display,drawgetobj,%
```

```
787    drawreobj,drawsetobj,dst,duplicate,dxflayers,dxfread,dxfwrite,%
788    econe2,econe3,eigloop,elcconstr,elcplbnd,elcplextr,elcplproj,%
789    elcplscalar,elempty,elemreobj,eleqc,eleqw,elevate,elgeom,ellip1,%
790    ellip2,ellipsoid2,ellipsoid3,ellipsoidgen_fl23,elmat,elovar,%
791    elpconstr,elshape,elvar,elvarm,embed,extrude,face3,faceprim3,%
792    fastsetop,fem2jxfem,femblocksu,femdiff,femeig,femexport,femgui,%
793    femimport,femiter,femlab,femlin,femmesh,femmeshexp,femnlin,%
794    femplot,femsfun,femsim,femsimlowlevel,femsimserver,femsol,%
795    femsolver,femstate,femstruct,femtime,femwave,festyle,fieldnames,%
796    fillet,fl1d,fl2d,fl3d,flaction,flafun,flappconvert,flappobj,%
797    flaxisequal,flbase,flbinary,flc1hs,flc2hs,flcanpnt,flcell2draw,%
798    flclear,flcolorbar,flcompact,flconeplot,flcontour2mesh,%
799    flcontour2meshaux,flconvreact,flconvreact1d,flconvreact2d,%
800    flconvreact3d,flcyl,fldc1hs,fldc2hs,fldegree,fldegreer3,%
801    fldegreet3,fldimvarsget,fldisp,fldraw2cell,fldrawnow,fldsmhs,%
802    fldsmsign,flevalmat,flexch,flexchprop,flfastgeom,flform,flgc,%
803    flgcbo,flgdconv,flgeom2cellstr,flgeomadj,flgeomarcize,flgeomec,%
804    flgeomed,flgeomepol,flgeomes,flgeomfc,flgeomfd,flgeomfdp,%
805    flgeomff1,flgeomff2,flgeomfn,flgeomfs,flgeomgetlocalsys,%
806    flgeominit,flgeominitprop,flgeomitransform,flgeomloft,flgeommesh,%
807    flgeomnbs,flgeomnes,flgeomnmr,flgeomnv,flgeompsinv,flgeomrmsing,%
808    flgeomrotp,flgeomsd,flgeomsdim,flgeomse,flgeomsf2,flgeomspm,%
809    flgeomtransform,flgeomud,flgeomvtx,flgetdraw,flheat,flheat1d,%
810    flheat2d,flheat3d,flhelmholtz,flhelmholtz1d,flhelmholtz2d,%
811    flhelmholtz3d,flim2curve,flinterp1,fliscont,flismember,%
812    flisnumeric,fljaction,fllaplace,fllaplace1d,fllaplace2d,%
813    fllaplace3d,flload,flloadfl,flloadmatfile,flloadmfile,%
814    fllobj2cellstr,flmakeevalstr,flmapsoljac,flmat2str,flmatch,%
815    flmesh2spline,flmesh2splineaux,flml65setup,flngdof,flnull,%
816    flnullorth,flpde,flpdeac,flpdec,flpdec1d,flpdec2d,flpdec3d,%
817    flpdedc,flpdedc2d,flpdedc3d,flpdedf,flpdedf1d,flpdedf2d,%
818    flpdedf3d,flpdees,flpdees2d,flpdees3d,flpdeg,flpdeg1d,flpdeg2d,%
819    flpdeg3d,flpdeht,flpdeht1d,flpdeht2d,flpdeht3d,flpdems,flpdems2d,%
820    flpdems3d,flpdens,flpdens2d,flpdens3d,flpdepn,flpdeps,flpdesm3d,%
821    flpdew,flpdew1d,flpdew2d,flpdew3d,flpdewb,flpdewb1d,flpdewb2d,%
822    flpdewb3d,flpdewc,flpdewc1d,flpdewc2d,flpdewc3d,flpdewe,%
823    flpdewe3d,flpdewp,flpdewp2d,flpdewp3d,flplot,flpoisson,%
824    flpoisson1d,flpoisson2d,flpoisson3d,flpric2,flpric3,flreobj,%
825    flreport,flresolvepath,flsave,flschrodinger,flschrodinger1d,%
826    flschrodinger2d,flschrodinger3d,flsde,flsdp,flsdt,flsetalpha,%
827    flsetdraw,flsmhs,flsmsign,flspnull,fltherm_cond1,fltrg,flversion,%
828    flversions,flverver,flwave,flwave1d,flwave2d,flwave3d,%
829    flwriteghist,formstr,gdsread,gencyl2,gencyl3,genextrude,%
830    genextrudeaux,geom,geom0,geom0get,geom1,geom1get,geom2,geom2get,%
831    geom3,geom3get,geom3j2m,geom3m2j,geomaddlblmargin,geomanalyze,%
832    geomarrayr,geomassign,geomcoerce,geomcomp,geomconnect,geomcopy,%
833    geomcsg,geomdel,geomedit,geomexport,geomfile,geomget,%
834    geomgetlabels,geomgetwrkpln,geomimport,geominfo,geominfoaux,%
835    geomlblplot,geomload,geomnumparse,geomobject,geomparse,geomplot,%
836    geomplot1,geomplot2,geomplot3,geomposition,geomproputil,%
837    geomreconstruct,geomreobj,geomserver,geomspline,geomsurf,%
838    geomupdate,get,getfemgeom,getisocurve,getjptr,getmesh,getsdim,%
839    getvmatrixexch,handlesolnumstr,helix1,helix2,helix3,hexahedron2,%
840    hexahedron3,histfrommat,idst,igesread,importplotdata,isempty,%
```

```
841        isfield,isfunc,isscript,javaclass,jproputil,jptr2geom,jptrgeom1,%
842        jptrgeom1_fl23,jptrgeom2,jptrgeom2_fl23,jptrgeom3,jptrgeom3_fl23,%
843        keiter,line1,line2,loadobj,loft,matlabinterpdata,mesh2geom,%
844        meshassign,meshcaseadd,meshcasedel,meshcaseutil,meshcheck,%
845        meshembed,meshenrich,meshenrich1,meshenrich2,meshenrich3,%
846        meshexport,meshextend,meshextrude,meshget,meshimport,meshinit,%
847        meshintegrate,meshmap,meshoptim,meshparse,meshplot,meshplot1,%
848        meshplot2,meshplot3,meshplotproputil,meshpoi,meshproputil,%
849        meshptplot,meshqual,meshrefine,meshrevolve,meshsmooth,%
850        meshsmooth2,meshsweep,meshvolume,minus,mirror,mkreflparams,%
851        mmsolve,modetype,move,moveglobalfields,mphproputil,mtimes,%
852        multiphysics,mypostinterp,notscript,onlyelsconstr,outassign,%
853        paramgeom,pde2draw,pde2equ,pde2fem,pde2geom,pdeblxpd,plus,point1,%
854        point2,point3,poisson,poly1,poly2,postanim,postapplysettings,%
855        postarrow,postarrowbnd,postcolorbar,postcont,postcontdomind,%
856        postcoord,postcopyprop,postcrossplot,postdistrprops,posteval,%
857        postflow,postfnd,postgeomplot,postgetfem,postgetstylecolor,%
858        postglobaleval,postglobalplot,postgp,postinit,postint,postinterp,%
859        postiso,postlin,postmakecontcol,postmax,postmaxmin,postmin,%
860        postmkcontbar,postmknormexpr,postmovie,postnewplot,%
861        postoldmaxminprops,postpd2pm,postplot,postplotconstants,%
862        postpm2pd,postprinc,postprincbnd,postprocgui,postproputil,%
863        postslice,postsurf,posttet,posttitle,print2file,pyramid2,%
864        pyramid3,rect1,rect2,restorefields,revolve,rmfield,rotate,%
865        rotmatrix,scale,serialize,set,setmesh,sh2str,sharg_2_5,shbub,%
866        shdisc,shdiv,shherm,shlag,shvec,simplecoerce,simreobj,slblocks,%
867        solassign,solid0,solid1,solid2,solid3,solidprim3,solproputil,%
868        solsize,solveraddcases,sphere2,sphere3,spiceimport,splineaux,%
869        split,splittoprim,square1,square2,stlread,submode,submodes,%
870        subsasgn,subsref,tangent,taucs,tetrahedron2,tetrahedron3,%
871        tobsplines,torus2,torus3,transform,update,updateassoc,%
872        updateassocinfo,updatefem,updateguistruct,updateobj,vrmlread,%
873        xmeshinfo,xmeshinit},%
874    sensitive=false,%
875    morecomment=[l]\%,%
876    morestring=[m]'%
877  }[keywords,comments,strings]%
878 ⟨/lang3⟩
```

2.18   bash, csh, and sh

csh is from Kai Below, but he pointed out that some keywords are probably missing.

```
879 ⟨*lang1⟩
880 %%
881 %% csh definition (c) 1998 Kai Below
882 %%
883 \lst@definelanguage{csh}
884   {morekeywords={alias,awk,cat,echo,else,end,endif,endsw,exec,exit,%
885       foreach,glob,goto,history,if,logout,nice,nohup,onintr,repeat,sed,%
886       set,setenv,shift,source,switch,then,time,while,umask,unalias,%
887       unset,wait,while,@,env,argv,child,home,ignoreeof,noclobber,%
888       noglob,nomatch,path,prompt,shell,status,verbose,print,printf,%
```

```
889       sqrt,BEGIN,END},%
890    morecomment=[l]\#,%
891    morestring=[d]"%
892    }[keywords,comments,strings]%
```

Thanks to Riccardo Murri for the following two definitions. Scott Pakin pointed
out some missing keywords (`elif`, `in` for `sh`, `caller`, `compopt`, `coproc`, `dirs`,
`help`, `mapfile`, `readarray` for `bash`) to the current maintainer. The `sh` list of key-
words was checkead against the "Manual of the Bourne Shell on Version 7", found
at http://www.in-ulm.de/~mascheck/bourne/v7/, last visited on 2014/09/06.
Ralf Schandl indicated the missing of an apostrophe as delimiter of strings.

```
893 %%
894 %% bash,sh definition (c) 2003 Riccardo Murri <riccardo.murri@gmx.it>
895 %%
896 \lst@definelanguage{bash}[]{sh}%
897    {morekeywords={alias,bg,bind,builtin,caller,command,compgen,compopt,%
898        complete,coproc,declare,disown,dirs,enable,fc,fg,help,history,%
899        jobs,let,local,logout,mapfile,printf,pushd,popd,readarray,select,%
900        set,suspend,shopt,source,times,type,typeset,ulimit,unalias,wait},%
901    }%
902 \lst@definelanguage{sh}%
903    {morekeywords={awk,break,case,cat,cd,continue,do,done,echo,elif,else,%
904        env,esac,eval,exec,exit,export,expr,false,fi,for,function,getopts,%
905        hash,history,if,in,kill,login,newgrp,nice,nohup,ps,pwd,read,%
906        readonly,return,set,sed,shift,test,then,times,trap,true,type,%
907        ulimit,umask,unset,until,wait,while},%
908    morecomment=[l]\#,%
909    morestring=[d]",%
910    morestring=[d]'%
911    }[keywords,comments,strings]%
912 ⟨/lang1⟩
```

Jobst Hoffmann copied the definition of a style for printing Fortran code to a
style for printing shell programs:

```
913 ⟨∗bash-prf⟩

914 \usepackage[rgb, x11names]{xcolor}
915
916 % common settings
917 \lstset{%
918    frame=tlb,%        the frame is open on the right side
919    resetmargins=false,%
920    rulesepcolor=\color{black},%
921    numbers=left,%            % left
922    numberstyle=\tiny,%
923    numbersep=5pt,%
924    firstnumber=1,%
925    stepnumber=5,%
926    columns=fixed,%           % to prevent inserting spaces
927    fontadjust=true,%
928    keepspaces=true,%
929    basewidth=0.5em,%
930    captionpos=t,%
931    abovecaptionskip=\smallskipamount,% same amount as default
932    belowcaptionskip=\smallskipamount,% in caption package
```

```
933 }
934 % settings for colored printing
935 \lstdefinestyle{bash}{%
936    backgroundcolor=\color{yellow!10},%
937    basicstyle=\small\ttfamily,%
938    identifierstyle=\color{black},%
939    keywordstyle=\color{blue},%
940    keywordstyle={[2]\color{cyan}},%
941    keywordstyle={[3]\color{olive}},%
942    stringstyle=\color{teal},%
943    commentstyle=\itshape\color{orange},%
944 }%
945 % settings for back and white printing
946 \lstdefinestyle{bashbw}{%
947    backgroundcolor={},%
948    basicstyle=\small\ttfamily,%
949    identifierstyle={},%
950    keywordstyle=\bfseries,%
951    stringstyle=\itshape,%
952    commentstyle=\slshape,%
953    rulesepcolor=\color{black},%
954 }%
```

This code is provided in the file `listings-bash.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
955 ⟨/bash-prf⟩
```

2.19 Delphi

I took the data from Delphi 1.0 (?) online help. Christian Gudrian provided the 'double slash' comment.

```
956 ⟨*lang2⟩

957 \lst@definelanguage{Delphi}%
958    {morekeywords={and,as,asm,array,begin,case,class,const,constructor,%
959        destructor,div,do,downto,else,end,except,exports,file,finally,%
960        for,function,goto,if,implementation,in,inherited,inline,%
961        initialization,interface,is,label,library,mod,nil,not,object,of,%
962        or,packed,procedure,program,property,raise,record,repeat,set,%
963        shl,shr,string,then,to,try,type,unit,until,uses,var,while,with,%
964        xor,%
965        absolute,abstract,assembler,at,cdecl,default,dynamic,export,%
966        external,far,forward,index,name,near,nodefault,on,override,%
967        private,protected,public,published,read,resident,storedDir,%
968        virtual,write},%
969     morendkeywords={Abs,AddExitProc,Addr,AllocMem,AnsiCompareStr,%
970        AnsiCompareText,AnsiLowerCase,AnsiUpperCase,Append,AppendStr,%
971        ArcTan,AssignCrt,Assigned,AssignFile,BlockRead,BlockWrite,Break,%
972        ChangeFileExt,ChDir,Chr,CloseFile,ClrEol,ClrScr,Concat,Continue,%
973        Copy,Cos,CSeg,CursorTo,Date,DateTimeToFileDate,DateTimeToStr,%
974        DateTimeToString,DateToStr,DayOfWeek,Dec,DecodeDate,DecodeTime,%
975        Delete,DeleteFile,DiskFree,DiskSize,Dispose,DisposeStr,%
976        DoneWinCrt,DSeg,EncodeDate,EncodeTime,Eof,Eoln,Erase,Exclude,%
977        Exit,Exp,ExpandFileName,ExtractFileExt,ExtractFileName,%
```

```
978      ExtractFilePath,FileAge,FileClose,FileDateToDateTime,FileExists,%
979      FileGetAttr,FileGetDate,FileOpen,FilePos,FileRead,FileSearch,%
980      FileSeek,FileSetAttr,FileSetDate,FileSize,FillChar,FindClose,%
981      FindFirst,FindNext,FloatToDecimal,FloatToStrF,FloatToStr,%
982      FloatToText,FloatToTextFmt,Flush,FmtLoadStr,FmtStr,Format,%
983      FormatBuf,FormatDateTime,FormatFloat,Frac,Free,FreeMem,GetDir,%
984      GetMem,GotoXY,Halt,Hi,High,Inc,Include,InitWinCrt,Insert,Int,%
985      IntToHex,IntToStr,IOResult,IsValidIdent,KeyPressed,Length,Ln,Lo,%
986      LoadStr,Low,LowerCase,MaxAvail,MemAvail,MkDir,Move,New,NewStr,%
987      Now,Odd,Ofs,Ord,ParamCount,ParamStr,Pi,Pos,Pred,Ptr,Random,%
988      Randomize,Read,ReadBuf,ReadKey,Readln,ReAllocMem,Rename,%
989      RenameFile,Reset,Rewrite,RmDir,Round,RunError,ScrollTo,Seek,%
990      SeekEof,SeekEoln,Seg,SetTextBuf,Sin,SizeOf,SPtr,Sqr,Sqrt,SSeg,%
991      Str,StrCat,StrComp,StrCopy,StrDispose,StrECopy,StrEnd,StrFmt,%
992      StrLCat,StrIComp,StrLComp,StrLCopy,StrLen,StrLFmt,StrLIComp,%
993      StrLower,StrMove,StrNew,StrPas,StrPCopy,StrPos,StrScan,StrRScan,%
994      StrToDate,StrToDateTime,StrToFloat,StrToInt,StrToIntDef,%
995      StrToTime,StrUpper,Succ,Swap,TextToFloat,Time,TimeToStr,%
996      TrackCursor,Trunc,Truncate,TypeOf,UpCase,UpperCase,Val,WhereX,%
997      WhereY,Write,WriteBuf,WriteChar,Writeln},%
998    sensitive=f,%
999    morecomment=[s]{(*}{*)},%
1000   morecomment=[s]{\{}{\}},%
1001   morecomment=[l]{//},% 2001 Christian Gudrian
1002   morestring=[d]'%
1003   }[keywords,comments,strings]%

1004 ⟨/lang2⟩
```

2.20   Eiffel

Data is from

- BERTRAND MEYER: **Eiffel: the language**; Prentice Hall International (UK) Ldt, 1992; ISBN 0-13-247925-7.

```
1005 ⟨∗lang2⟩
1006 \lst@definelanguage{Eiffel}%
1007   {morekeywords={alias,all,and,as,BIT,BOOLEAN,CHARACTER,check,class,%
1008      creation,Current,debug,deferred,do,DOUBLE,else,elseif,end,%
1009      ensure,expanded,export,external,false,feature,from,frozen,if,%
1010      implies,indexing,infix,inherit,inspect,INTEGER,invariant,is,%
1011      like,local,loop,NONE,not,obsolete,old,once,or,POINTER,prefix,%
1012      REAL,redefine,rename,require,rescue,Result,retry,select,%
1013      separate,STRING,strip,then,true,undefine,unique,until,variant,%
1014      when,xor},%
1015    sensitive,%
1016    morecomment=[l]--,%
1017    morestring=[d]",%
1018   }[keywords,comments,strings]%
```

The key=value `stringtest=false` has been removed after a bug report from Xavier Crégut.

```
1019 ⟨/lang2⟩
```

2.21 Elan

The data come from

- LEO H. KLINGEN, JOCHEN LIEDTKE: **Programmieren mit ELAN**; B.G. Teubner, Stuttgart 1983; ISBN 3-519-02507-8.

```
1020 ⟨∗lang3⟩

1021 \lst@definelanguage{Elan}%
1022   {morekeywords={ABS,AND,BOOL,CAND,CASE,CAT,COLUMNS,CONCR,CONJ,CONST,%
1023       COR,DECR,DEFINES,DET,DIV,DOWNTO,ELIF,ELSE,END,ENDIF,ENDOP,%
1024       ENDPACKET,ENDPROC,ENDREP,ENDSELECT,FALSE,FI,FILE,FOR,FROM,IF,%
1025       INCR,INT,INV,LEAVE,LENGTH,LET,MOD,NOT,OF,OP,OR,OTHERWISE,PACKET,%
1026       PROC,REAL,REP,REPEAT,ROW,ROWS,SELECT,SIGN,STRUCT,SUB,TEXT,THEN,%
1027       TRANSP,TRUE,TYPE,UNTIL,UPTO,VAR,WHILE,WITH,XOR,%
1028       maxint,sign,abs,min,max,random,initializerandom,subtext,code,%
1029       replace,text,laenge,pos,compress,change,maxreal,smallreal,floor,%
1030       pi,e,ln,log2,log10,sqrt,exp,tan,tand,sin,sind,cos,cosd,arctan,%
1031       arctand,int,real,lastconversionok,put,putline,line,page,get,%
1032       getline,input,output,sequentialfile,maxlinelaenge,reset,eof,%
1033       close,complexzero,complexone,complexi,complex,realpart,imagpart,%
1034       dphi,phi,vector,norm,replace,matrix,idn,row,column,sub,%
1035       replacerow,replacecolumn,replaceelement,transp,errorsstop,stop},%
1036     sensitive,%
1037     morestring=[d]"%
1038   }[keywords,strings]%

1039 ⟨/lang3⟩
```

2.22 Erlang

Thanks to Daniel Gazard.

```
1040 ⟨∗lang3⟩

1041 %%
1042 %% Erlang definition (c) 2003 Daniel Gazard
1043 %%
1044 \lst@definelanguage{erlang}%
1045   {morekeywords={abs,after,and,apply,atom,atom_to_list,band,binary,%
1046       binary_to_list,binary_to_term,bor,bsl,bsr,bxor,case,catch,%
1047       date,div,element,erase,end,exit,export,float,float_to_list,%
1048       get,halt,hash,hd,if,info,import,integer,integer_to_list,%
1049       length,link,list,list_to_atom,list_to_float,list_to_integer,%
1050       list_to_tuple,module,node,nodes,now,of,or,pid,port,ports,%
1051       processes,put,receive,reference,register,registered,rem,%
1052       round,self,setelement,size,spawn,throw,time,tl,trace,trunc,%
1053       tuple,tuple_to_list,unlink,unregister,whereis,error,false,%
1054       infinity,nil,ok,true,undefined,when},%
1055     otherkeywords={->,!,[,],\{,\}},%
1056     morecomment=[l]\%,%
1057     morestring=[b]",%
1058     morestring=[b]'%
1059   }[keywords,comments,strings]%

1060 ⟨/lang3⟩
```

2.23 Euphoria

Detlef Reimers sent me the language definition.

```
1061 ⟨∗lang2⟩

1062 %%
1063 %% Euphoria definition (c) 1998 Detlef Reimers
1064 %%
1065 \lst@definelanguage{Euphoria}%
1066 % for Euphoria 2.0, Rapid Deployment Software, Kanada
1067   {morekeywords={abort,and,and_bits,append,arctan,atom,by,call,%
1068       call_proc,call_func,c_proc,c_func,clear_screen,close,%
1069       command_line,compare,constant,cos,do,date,else,elsif,end,exit,%
1070       find,floor,for,function,getc,getenv,get_key,gets,global,%
1071       get_pixel,if,include,integer,length,log,match,machine_func,%
1072       machine_proc,mem_copy,mem_set,not,not_bits,or,object,open,%
1073       or_bits,procedure,puts,position,prepend,print,printf,power,peek,%
1074       poke,pixel,poke4,peek4s,peek4u,return,rand,repeat,remainder,%
1075       routine_id,sequence,sqrt,sin,system,sprintf,then,type,to,time,%
1076       trace,tan,while,with,without,xor,xor_bits},%
1077   sensitive,%
1078   morecomment=[l]--,%
1079   morestring=[d]',%
1080   morestring=[d]"%
1081   }[keywords,comments,strings]%

1082 ⟨/lang2⟩
```

2.24 Fortran

Took things from

- KARL HANS MÜLLER: **Fortran 77: Programmierungsanleitung**; 3., völlig neu bearb. Aufl. – Mannheim; Wien; Zürich: Bibliographisches Institut, 1984; ISBN 3-411-05804-8

- THOMAS MICHEL: **Fortran 90: Lehr– und Handbuch**; Mannheim; Leipzig; Wien; Zürich: BI-Wiss.-Verlag, 1994; ISBN 3-411-16861-7.

Another source for Fortran keywords is http://fortranwiki.org/fortran/show/Keywords where the keywords for Fortran 2003 and 2008 are taken from.

```
1083 ⟨∗lang1⟩
```

The current version of Fortran (Fortran 2018) is defined by ISO/IEC 1539-1:2018, for a deeper insight have a look at https://wg5-fortran.org/f2018.html. It contains ? new keywords, ? of them consisting of two words: `FAIL IMAGE`, so the list of keywords contains the single parts `FAIL` and `IMAGE`. So there is the following definition of Fortran 2018 keywords

```
1084 \lst@definelanguage[18]{Fortran}[08]{Fortran}{%
1085   morekeywords={FAIL, IMAGE, NON_RECURSIVE},%
```

and procedures:

```
1086   morekeywords=[3]{GET_TEAM, TEAM_NUMBER, IMAGE_TEAMS, NUM_IMAGES,
1087     THIS_IMAGE, FAILED_IMAGES, STOPPED_IMAGES, IMAGES_STATUS, CO_BROADCAST,
1088   CO_MAX, CO_MIN, CO_SUM, CO_REDUCE, ATOMIC_ADD, ATOMIC_AND, ATOMIC_OR,
1089   ATOMIC_XOR, ATOMIC_FETCH_ADD, ATOMIC_FETCH_AND, ATOMIC_FETCH_OR,
```

```
1090    ATOMIC_FETCH_XOR, ATOMIC_FETCH_CAS, IEEE_GET_MODES, IEEE_SET_MODES,
1091    IEEE_FMA, IEEE_SIGNBIT, IEEE_INT, IEEE_REM, IEEE_MAX_NUM, IEEE_MAX_NUM_MAG, IEEE_MIN_NUM,
1092 }%
```

The Fortran 2008 version is defined by ISO/IEC 1539-1:2010. It contains nine new keywords, four of them consisting of two words: `ERROR STOP`, `SYNC ALL`, `SYNC IMAGES`, `SYNC MEMORY`, so the list of keywords contains the single parts `ALL`, `ERROR`, `IMAGES`, `MEMORY`, and `SYNC`.

```
1093 \lst@definelanguage[08]{Fortran}[03]{Fortran}{%
1094   morekeywords={ALL, BLOCK, CODIMENSION, CONCURRENT, CONTIGUOUS, CRITICAL,%
1095     ERROR, IMAGES, LOCK, MEMORY, SUBMODULE, SYNC, UNLOCK},%
```

New procedures in Fortran 2008:

```
1096   morekeywords=[3]{ACOSH, ASINH, ATANH, ATOMIC_DEFINE, ATOMIC_REF,%
1097     BESSEL_J0, BESSEL_J1, BESSEL_JN, BESSEL_Y0, BESSEL_Y1, BESSEL_YN,%
1098     BGE, BGT, BLE, BLT, C_SIZEOF, COMPILER_OPTIONS, COMPILER_VERSION,%
1099     DSHIFTL, DSHIFTR, ERF, ERFC, ERFC_SCALED, EXECUTE_COMMAND_LINE,%
1100     FINDLOC, GAMMA, HYPOT, IALL, IANY, IMAGE_INDEX, IPARITY, LCOBOUND,%
1101     LEADZ, LOG_GAMMA, MASKL, MASKR, MERGE_BITS, NORM2, NUM_IMAGES,%
1102     PARITY, POPCNT, POPPAR, SHIFTA, SHIFTL, SHIFTR, STORAGE_SIZE,%
1103     THIS_IMAGE, TRAILZ, UCOBOUND}%
1104 }%
```

Fortran 2003 introduces the following keywords:

```
1105 \lst@definelanguage[03]{Fortran}[95]{Fortran}{%
1106   morekeywords={ABSTRACT, ASSOCIATE, ASYNCHRONOUS, BIND, CLASS, DEFERRED,%
1107     ENUM, ENUMERATOR, EXTENDS, FINAL, FLUSH, GENERIC, IMPORT,%
1108     NON_OVERRIDABLE, NOPASS, PASS, PROTECTED, VALUE, VOLATILE, WAIT},%
```

These are new options/specifiers:

```
1109     morekeywords=[2]{DECIMAL, ENCODING, IOMSG, ROUND},%
```

And also some new procedures:

```
1110   morekeywords=[3]{C_ASSOCIATED, C_F_POINTER, C_F_PROCPOINTER, C_FUNLOC,%
1111     C_LOC, COMMAND_ARGUMENT_COUNT, EXTENDS_TYPE_OF, GET_COMMAND,%
1112     GET_COMMAND_ARGUMENT, GET_ENVIRONMENT_VARIABLE, IS_IOSTAT_END,%
1113     MOVE_ALLOC,NEW_LINE,SAME_TYPE_AS, SELECTED_CHAR_KIND}%
1114 }%
```

Denis Girou proposed to have Fortran 95 and Fortran 90 to be equivalent.

```
1115 \lst@definelanguage[90]{Fortran}[95]{Fortran}{}
```

There is no `morecomment=[f]` in Fortran 90 since otherwise `CONTAINS` could start a comment. This problem was reported by Magne Rudshaug. Moreover the keyword `INCLUDE` is due to him.

```
1116 \lst@definelanguage[95]{Fortran}[77]{Fortran}{%
1117   deletekeywords=SAVE,%
1118   morekeywords={ALLOCATABLE, ALLOCATE, ASSIGNMENT, CASE, CONTAINS, CYCLE,%
1119     DEALLOCATE, DEFAULT, EXIT, INCLUDE, IN, NONE, OUT, INTENT, INTERFACE,%
1120     MODULE, NAMELIST, NULLIFY, ONLY, OPERATOR, OPTIONAL, OUT, POINTER,%
1121     PRIVATE, PUBLIC, RECURSIVE, RESULT, SELECT, SEQUENCE, TARGET, TYPE,%
1122     USE, WHERE, WHILE, BLOCKDATA, DOUBLEPRECISION, ENDBLOCKDATA, ENDFILE,%
1123     ENDFUNCTION, ENDINTERFACE, ENDMODULE, ENDPROGRAM, ENDSELECT,%
1124     ENDSUBROUTINE, ENDTYPE, ENDWHERE, INOUT, SELECTCASE,%
```

Theses keys were missing from the 1.4 version of listings:

```
1125     ELEMENTAL, ELSEWHERE, FORALL, PURE,%
```

This is another key missing from the 1.4 version of listings:

```
1126        PROCEDURE},%
```

The list of option keywords/specifiers new in Fortran 90 and 95:

```
1127  morekeywords=[2]{ACTION, ADVANCE, DELIM, IOLENGTH, LEN, NAME, NML, PAD,%
1128     POSITION, READWRITE, SIZE, STAT},% corrected NML from NMT
```

and the list of intrinsic procedures new in Fortran 90 and 95:

```
1129  morekeywords=[3]{ACHAR, ADJUSTL, ADJUSTR, ALL, ALLOCATED, ANY, ASSOCIATED,%
1130     BIT_SIZE, BTEST, CEILING, COUNT, CPU_TIME, CSHIFT, DATE_AND_TIME, DIGITS,%
1131     DOT_PRODUCT, EOSHIFT, EPSILON, EXPONENT, FLOOR, FRACTION, HUGE, IACHAR,%
1132     IAND, IBCLR, IBITS, IBSET, ICHAR, IEOR, IOR, ISHFT, ISHFTC, KIND, LBOUND,%
1133     LEN_TRIM,% left out LOGICAL
1134     MATMUL, MAXEXPONENT, MAXLOC, MAXVAL, MERGE, MINEXPONENT, MINLOC, MINVAL,%
1135     MODULO, MVBITS, NEAREST, NOT, NULL, PACK, PRECISION, PRESENT, PRODUCT,%
1136     RADIX, RANDOM_NUMBER, RANDOM_SEED, RANGE, RANK, REPEAT, RESHAPE,%
1137     RRSPACING, SCALE, SCAN, SELECTED_INT_KIND, SELECTED_REAL_KIND,%
1138     SET_EXPONENT, SHAPE, SINH, SIZE, SPACING, SPREAD, SUM, SYSTEM_CLOCK,%
1139     TINY, TRANSFER, TRANSPOSE, TRIM, UBOUND, UNPACK, VERIFY},%
1140  deletecomment=[f],% no fixed comment line: 1998 Magne Rudshaug
1141 morecomment=[l]!%
1142 }%
```

As proposed by Jörn Wilms keywords are *not* case sensitive. Also, note that Fortran 77 (and fixed-format source in later versions) allows space in keywords; thus, this list contains some of the more common variants (e.g., 'GO TO' and 'GOTO').

```
1143 \lst@definelanguage[77]{Fortran}{%
```

Jobst Hoffmann divided the list of keywords into two lists. The first list contains the statement keywords, the second list contains the option keywords/specifiers and values. This makes the different meanings of the keywords distinguishable.

```
1144  morekeywords={ASSIGN, BACKSPACE, CALL, CHARACTER, %
1145     CLOSE, COMMON, COMPLEX, CONTINUE, DATA, DIMENSION, DO, DOUBLE, %
1146     ELSE, ELSEIF, END, ENDIF, ENDDO, ENTRY, EQUIVALENCE, EXTERNAL, %
1147     FILE, FORMAT, FUNCTION, GO, TO, GOTO, IF, IMPLICIT, %
1148     INQUIRE, INTEGER, INTRINSIC, LOGICAL, %
1149     OPEN, PARAMETER, PAUSE, PRECISION, PRINT, PROGRAM, READ, REAL, %
1150     RETURN, REWIND, SAVE, STOP, SUBROUTINE, THEN, %
1151     WRITE},%
1152  morekeywords=[2]{ACCESS, BLANK, BLOCK, DIRECT, EOF, ERR, EXIST,%
1153     FMT, FORM, FORMATTED, IOSTAT, NAMED, NEXTREC, NUMBER, OPENED,%
1154     REC, RECL, SEQUENTIAL, STATUS, TYPE, UNFORMATTED, UNIT},%
```

And here is another list: the list of intrinsic procedures (remember: all functions belong to the Fortran language specification!)

```
1155  morekeywords=[3]{INT, DBLE, CMPLX, ICHAR, CHAR, AINT, ANINT,% left out real
1156     NINT, ABS, MOD, SIGN, DIM, DPROD, MAX, MIN, AIMAG, CONJG, SQRT,%
1157     EXP, LOG, LOG10, SIN, COS, TAN, ASIN, ACOS, ATAN, ATAN2, SINH,%
1158     COSH, TANH, LGE, LGT, LLE, LLT, LEN, INDEX},%
```

And here is the last list: fortran operators:

```
1159  morekeywords=[4]{AND, EQ, EQV, FALSE, GE, GT, OR, LE, LT, NE, NEQV,%
1160     NOT, TRUE},%
1161  sensitive=f,%% not Fortran-77 standard, but allowed in Fortran-95 %%
1162  morecomment=[f]*,%
1163  morecomment=[f]C,%
```

```
1164    morecomment=[f]c,%
1165    morestring=[d]",%% not Fortran-77 standard, but allowed in Fortran-95 %%
1166    morestring=[d]'%
1167  }[keywords,comments,strings]%
```

1168 ⟨/lang1⟩

Jobst Hoffmann supplied a definition of a style for printing Fortran code:

1169 ⟨*fortran-prf⟩

```
1170 \usepackage[rgb, x11names]{xcolor}
1171
1172 % common settings
1173 \lstset{%
1174   frame=tlb,%       the frame is open on the right side
1175   resetmargins=false,%
1176   rulesepcolor=\color{black},%
1177   numbers=left,%              % left
1178   numberstyle=\tiny,%
1179   numbersep=5pt,%
1180   firstnumber=1,%
1181   stepnumber=5,%
1182   columns=fixed,%             % to prevent inserting spaces
1183   fontadjust=true,%
1184   keepspaces=true,%
1185   basewidth=0.5em,%
1186   captionpos=t,%
1187   abovecaptionskip=\smallskipamount,% same amount as default
1188   belowcaptionskip=\smallskipamount,% in caption package
1189 }
1190 % settings for colored printing
1191 \lstdefinestyle{fortran}{%
1192   backgroundcolor=\color{yellow!10},%
1193   basicstyle=\small\ttfamily,%
1194   identifierstyle=\color{black},%
1195   keywordstyle=\color{blue},%
1196   keywordstyle={[2]\color{cyan}},%
1197   keywordstyle={[3]\color{olive}},%
1198   stringstyle=\color{teal},%
1199   commentstyle=\itshape\color{orange},%
1200 }%
1201 % settings for back and white printing
1202 \lstdefinestyle{fortranbw}{%
1203   backgroundcolor={},%
1204   basicstyle=\small\ttfamily,%
1205   identifierstyle={},%
1206   keywordstyle=\bfseries,%
1207   stringstyle=\itshape,%
1208   commentstyle=\slshape,%
1209   rulesepcolor=\color{black},%
1210 }%
```

This code is provided in the file `listings-fortran.prf`, see section 2.4.1 (Preferences) of the listings documentation.

1211 ⟨/fortran-prf⟩

2.25 GAP—Groups, Algorithms, Programming

GAP is a System for Computational Discrete Algebra, a description can be found at http://www.gap-system.org/. Heiko Oberdiek provided a language definition without knowing this language, so any error should be announced to the current maintainer of the listings package.

```
1212 ⟨*lang2⟩

1213 %%
1214 %% GAP definition
1215 %% (c) 2013 Heiko Oberdiek
1216 %%
1217 \lst@definelanguage{GAP}{%
1218   morekeywords={%
1219     Assert,Info,IsBound,QUIT,%
1220     TryNextMethod,Unbind,and,break,%
1221     continue,do,elif,%
1222     else,end,false,fi,for,%
1223     function,if,in,local,%
1224     mod,not,od,or,%
1225     quit,rec,repeat,return,%
1226     then,true,until,while%
1227   },%
1228   sensitive,%
1229   morecomment=[l]\#,%
1230   morestring=[b]",%
1231   morestring=[b]',%
1232 }[keywords,comments,strings]

1233 ⟨/lang2⟩
```

2.26 Go—Groups, Algorithms, Programming

From https://en.wikipedia.org/wiki/Go_(programming_language): Go (often referred to as Golang) is a programming language created by Google in 2009 by Robert Griesemer, Rob Pike, and Ken Thompson. Go is a statically typed, compiled language in the tradition of C, with memory safety, garbage collection, structural typing, and CSP-style concurrency. The compiler, tools, and source code are all free and open source.

Christian Maurer provided the following language definition.

```
1234 ⟨*lang3⟩

1235 %%
1236 %% Go definition
1237 %% (c) 2018 Christian Maurer
1238 %%
1239 \lst@definelanguage{Go}{%
1240   morekeywords={append,bool,break,byte,cap,case,chan,close,complex,%
1241     complex128,complex64,const,continue,copy,default,defer,delete,%
1242     else,error,fallthrough,false,float32,float64,for,func,go,goto,%
1243     if,imag,import,int,int16,int32,int64,int8,interface,iota,len,%
1244     make,map,new,nil,package,panic,print,println,range,real,%
1245     recover,return,rune,select,string,struct,switch,true,type,%
1246     uint,uint16,uint32,uint64,uint8,uintptr,var},%
1247   sensitive,%
```

```
1248  morecomment=[s]{/*}{*/},%
1249  morecomment=[l]//,%
1250  morestring=[b]',%
1251  morestring=[b]",%
1252  morestring=[s]{`}{`},%
1253  }[keywords,comments,strings]%

1254  ⟨/lang3⟩
```

2.27   Guarded Command Language (GCL)

As you can read below, Mark van Eijk provided this language definition.

```
1255  ⟨*lang2⟩

1256  %%
1257  %% Guarded Command Language (GCL)   definition
1258  %% (c) 2002 Mark van Eijk
1259  %%
1260  \lst@definelanguage{GCL}%
1261    {morekeywords={const,con,var,array,of,skip,if,fi,do,od,div,mod},%
1262     literate={|[}{\ensuremath{|\hskip -0.1em[}}2%
1263             {]|}{\ensuremath{]\hskip -0.1em|}}2%
1264     {[]}{\ensuremath{[\hskip -0.1em]}}2%
1265     {->}{\ensuremath{\rightarrow}~}2%
1266     {==}{\ensuremath{\equiv}~}2%
1267     {>=}{\ensuremath{\geq}~}2%
1268     {<=}{\ensuremath{\leq}~}2%
1269     {/\\}{\ensuremath{\land}~}2%
1270     {\\/}{\ensuremath{\lor}~}2%
1271     {!}{\ensuremath{\lnot}}1%
1272     {!=}{\ensuremath{\neq}~}2%
1273     {max}{\ensuremath{\uparrow}}1%
1274     {min}{\ensuremath{\downarrow}}1,%
1275     sensitive=f,%
1276     morecomment=[s]{\{}{\}},%
1277     morestring=[d]'%
1278    }[keywords,comments,strings]%

1279  ⟨/lang2⟩
```

2.28   Gnuplot

Thanks to Dr. Christoph Giess for providing this definition.

```
1280  ⟨*lang2⟩
1281  %%
1282  %% gnuplot definition (c) Christoph Giess
1283  %%
1284  \lst@definelanguage{Gnuplot}%
1285    {keywords={abs,acos,acosh,arg,asin,asinh,atan,atan2,atanh,besj0,%
1286         besj1,besy0,besy1,ceil,cos,cosh,erf,erfc,exp,floor,gamma,ibeta,%
1287         inverf,igamma,imag,invnorm,int,lgamma,log,log10,norm,rand,real,%
1288         sgn,sin,sinh,sqrt,tan,tanh,column,tm_hour,tm_mday,tm_min,tm_mon,%
1289         tm_sec,tm_wday,tm_yday,tm_year,valid,cd,call,clear,exit,fit,%
1290         help,if,load,pause,plot,print,pwd,quit,replot,reread,reset,save,%
1291         set,show,shell,splot,test,update,angles,arrow,autoscale,border,%
```

```
1292        boxwidth,clabel,clip,cntrparam,contour,data,dgrid3d,dummy,%
1293        format,function,functions,grid,hidden3d,isosamples,key,keytitle,%
1294        label,logscale,mapping,offsets,output,parametric,pointsize,%
1295        polar,rrange,samples,size,style,surface,terminal,tics,time,%
1296        timefmt,title,trange,urange,variables,view,vrange,xdata,xlabel,%
1297        xmargin,xrange,xtics,mxtics,mytics,xdtics,xmtics,xzeroaxis,%
1298        ydata,ylabel,yrange,ytics,ydtics,ymtics,yzeroaxis,zdata,zero,%
1299        zeroaxis,zlabel,zrange,ztics,zdtics,zmtics,timefm,using,title,%
1300        with,index,every,thru,smooth},%
1301    sensitive,%
1302    comment=[l]\#,%
1303    morestring=[b]",%
1304    morestring=[b]',%
1305  }[keywords,comments,strings]%
1306 ⟨/lang2⟩
```

2.29   Hansl/Gretl

Thanks to Ignacio Díaz-Emparanza, Riccardo (Jack) Lucchetti, and Sven Schreiber
for providing the definition of hansl. Hansl is the gretl scripting language (see
http://gretl.sourceforge.net).

```
1307 ⟨*lang2⟩

1308 \lst@definelanguage{hansl}{%
1309   showstringspaces = false, %
1310   morekeywords={ % hansl commands:
1311     add, adf, anova, append, ar, ar1, arbond, arch, arima, biprobit, break,%
1312     boxplot, chow, clear, coeffsum, coint, coint2, corr, corrgm, cusum,%
1313     data, dataset, delete, diff, difftest, discrete, dpanel, dummify,%
1314     duration, elif, else, end, endif, endloop, eqnprint, equation,%
1315     estimate, eval, fcast, flush, foreign, fractint, freq, function,%
1316     funcerr, garch, genr, gmm, gnuplot, graphpg, hausman, heckit, help,%
1317     hfplot, hsk, hurst, if, include, info, intreg, join, kpss, labels, lad,%
1318     lags, ldiff, leverage, levinlin, logistic, logit, logs, loop, mahal,%
1319     makepkg, markers, meantest, midasreg, mle, modeltab, modprint, modtest,%
1320     mpi, mpols, negbin, nls, normtest, nulldata, ols, omit, open, orthdev,%
1321     outfile, panel, pca, pergm, plot, poisson, print, printf, probit,%
1322     pvalue, quantreg, qlrtest, qqplot, quit, rename, reset, restrict,%
1323     rmplot, run, runs, scatters, sdiff, set, setinfo, setobs, setopt,%
1324     setmiss, smpl, spearman, square, store,%
1325     summary, system, tabprint, textplot, tobit, tsls, var, varlist,%
1326     vartest, vecm, vif, wls, xcorrgm, xtab, debug, return, catch, pkg,%
1327     arma, deriv, params, hessian, for, foreach, while, const},%
1328   morekeywords=[2]{ % accessors:
1329     \$nobs, \$nvars, \$pd, \$t1, \$t2, \$tmax, \$datatype, \$test,%
1330     \$pvalue, \$qlrbreak, \$rlnl, \$stopwatch, \$unit, \$obsmajor,%
1331     \$obsminor, \$obsmicro, \$obsdate, \$windows, \$version, \$error,%
1332     \$seed, \$huge, \$ess, \$T, \$rsq, \$sigma, \$df, \$ncoeff, \$lnl,%
1333     \$gmmcrit, \$aic, \$bic, \$hqc, \$trsq, \$dw, \$dwpval, \$Fstat,%
1334     \$chisq, \$diagtest, \$diagpval, \$pmanteau, \$uhat, \$yhat, \$llt,%
1335     \$ahat, \$sample, \$h, \$coeff, \$stderr, \$vcv, \$rho, \$compan,%
1336     \$xtxinv, \$vecGamma, \$vma, \$fevd, \$evals, \$jalpha, \$jbeta,%
1337     \$jvbeta, \$s00, \$s11, \$s01, \$ec, \$hausman, \$sargan, \$sysGamma,%
1338     \$sysA, \$sysB, \$fcast, \$fcse, \$coeff_ci, \$ehat, \$mnlprobs,%
```

33

```
1339     \$xlist, \$ylist, \$command, \$depvar, \$model, \$system, \$sysinfo},%
1340   morekeywords=[3]{ % functions
1341     BFGScmax, BFGSmax, GSSmax, I, NMmax, NRmax, abs, acos, acosh,%
1342     aggregate, argname, array, asin, asinh, atan, atanh, atof, bessel,%
1343     bkfilt, bootci, bootpval, boxcox, bread, bwfilt, bwrite, cdemean, cdf,%
1344     cdiv, cdummify, ceil, cholesky, chowlin, cmult, cnameget, cnameset,%
1345     cnorm, cnumber, cols, corr, corrgm, cos, cosh, cov, critical, cum,%
1346     curl, dayspan, defarray, defbundle, deflist, deseas, det, diag,%
1347     diagcat, diff, digamma, dnorm, dropcoll, dsort, dummify, easterday,%
1348     ecdf, eigengen, eigensym, eigsolve, epochday, errmsg, exists, exp,%
1349     fcstats, fdjac, feval, fevd, fft, ffti, filter, firstobs, fixname,%
1350     floor, fracdiff, fraclag, freq, gammafun, genseries, getenv, getinfo,%
1351     getkeys, getline, ghk, gini, ginv, grab, halton, hdprod, hfdiff,%
1352     hflags, hfldiff, hflist, hpfilt, imaxc, imaxr, imhof, iminc, iminr,%
1353     inbundle, infnorm, inlist, instring, int, inv, invcdf, invmills, invpd,%
1354     irf, irr, isconst, isdiscrete, isdummy, isnan, isoconv, isodate,%
1355     iwishart, jsonget, jsongetb, juldate, kdensity, kdsmooth, kfilter,%
1356     kmeier, kpsscrit, ksetup, ksimdata, ksimul, ksmooth, kurtosis, lags,%
1357     lastobs, ldet, ldiff, lincomb, linearize, ljungbox, lngamma, loess,%
1358     log, log10, log2, logistic, lower, lrcovar, lrvar, max, maxc, maxr,%
1359     mcorr, mcov, mcovg, mean, meanc, meanr, median, mexp, mgradient, min,%
1360     minc, minr, missing, misszero, mlag, mlincomb, mnormal, mols, monthlen,%
1361     movavg, mpiallred, mpibcast, mpirecv, mpireduce, mpiscatter, mpisend,%
1362     mpols, mrandgen, mread, mreverse, mrls, mshape, msortby, muniform,%
1363     mweights, mwrite, mxtab, naalen, nadarwat, nelem, ngetenv, nlines,%
1364     nobs, normal, normtest, npcorr, npv, nullspace, numhess, obslabel,%
1365     obsnum, ok, onenorm, ones, orthdev, pdf, pergm, pexpand, pmax, pmean,%
1366     pmin, pnobs, polroots, polyfit, princomp, printf, prodc, prodr, psd,%
1367     psdroot, pshrink, psum, pvalue, pxnobs, pxsum, qform, qlrpval, qnorm,%
1368     qrdecomp, quadtable, quantile, randgen, randgen1, randint, rank,%
1369     ranking, rcond, readfile, regsub, remove, replace, resample, rnameget,%
1370     rnameset, round, rows, sd, sdc, sdiff, seasonals, selifc, selifr, seq,%
1371     setnote, simann, sin, sinh, skewness, sleep, smplspan, sort, sortby,%
1372     sprintf, sqrt, square, sscanf, sst, stringify, strlen, strncmp,%
1373     strsplit, strstr, strstrip, strsub, strvals, substr, sum, sumall, sumc,%
1374     sumr, svd, svm, tan, tanh, toepsolv, tolower, toupper, tr, transp,%
1375     trimr, typeof, typestr, uniform, uniq, unvech, upper, urcpval, values,%
1376     var, varname, varnames, varnum, varsimul, vec, vech, weekday, wmean,%
1377     wsd, wvar, xmax, xmin, xmlget, zeromiss, zeros, NMmin, GSSmin,%
1378     BFGScmin, BFGSmin },%
1379   morekeywords=[4]{ % genr aliases:
1380     null, series, scalar, matrix, string, list, bundle, strings, matrices,%
1381     bundles, lists%
1382   },%
1383   sensitive=t,%
1384   morecomment=[l]{\#},%
1385   morecomment=[s]{/*}{*/},%
1386   morestring=[b]{"}%
1387 }%
1388 \lstalias{gretl}{hansl}
1389 ⟨/lang2⟩
```

The developers of the hansl support also supplied a definition of a style for printing hansl code:

```
1390 ⟨∗hansl-prf⟩

1391 \usepackage[rgb, x11names]{xcolor}
1392
1393 % settings for black and white
1394 \lstdefinestyle{hanslbw}{%
1395   keywordstyle = \bfseries,
1396   keywordstyle = [2]\bfseries,
1397   keywordstyle = [3]\itshape,
1398   keywordstyle = [4]\underbar,
1399   commentstyle = \ttfamily,
1400   stringstyle = \ttfamily
1401 }
1402 % settings for colored printing
1403 \lstdefinestyle{hanslcolor}{%
1404   basicstyle = \small\ttfamily,
1405   keywordstyle = \color{red},
1406   keywordstyle = [2]\color{green},
1407   keywordstyle = [3]\color{cyan},
1408   keywordstyle = [4]\color{olive},
1409   commentstyle = \color{blue}\rmfamily,%
1410   stringstyle = \color{magenta},
1411   moredelim = [l][\color{green}]{--}
1412 }%
```

This code is provided in the file `listings-hansl.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
1413 ⟨/hansl-prf⟩
```

2.30 Haskell

Thanks to Peter Bartke for providing the new definition.

```
1414 ⟨∗lang2⟩

1415 %%
1416 %% Haskell98 as implemented in Hugs98. See http://www.haskell.org
1417 %% All keywords from Prelude and Standard Libraries
1418 %% (c) 1999 Peter Bartke
1419 %%
1420 \lst@definelanguage{Haskell}%
1421   {otherkeywords={=>},%
1422    morekeywords={abstype,if,then,else,case,class,data,default,deriving,%
1423      hiding,if,in,infix,infixl,infixr,import,instance,let,module,%
1424      newtype,of,qualified,type,where,do,AbsoluteSeek,AppendMode,%
1425      Array,BlockBuffering,Bool,BufferMode,Char,Complex,Double,Either,%
1426      FilePath,Float,Int,Integer,IO,IOError,Ix,LineBuffering,Maybe,%
1427      Ordering,NoBuffering,ReadMode,ReadWriteMode,ReadS,RelativeSeek,%
1428      SeekFromEnd,SeekMode,ShowS,StdGen,String,Void,Bounded,Enum,Eq,%
1429      Eval,ExitCode,exitFailure,exitSuccess,Floating,Fractional,%
1430      Functor,Handle,HandlePosn,IOMode,Integral,List,Monad,MonadPlus,%
1431      MonadZero,Num,Numeric,Ord,Random,RandomGen,Ratio,Rational,Read,%
1432      Real,RealFloat,RealFrac,Show,System,Prelude,EQ,False,GT,Just,%
1433      Left,LT,Nothing,Right,WriteMode,True,abs,accum,accumArray,%
1434      accumulate,acos,acosh,all,and,any,ap,appendFile,applyM,%
1435      approxRational,array,asTypeOf,asin,asinh,assocs,atan,atan2,atanh,%
```

```
1436        bounds,bracket,bracket_,break,catch,catMaybes,ceiling,chr,cis,%
1437        compare,concat,concatMap,conjugate,const,cos,cosh,curry,cycle,%
1438        decodeFloat,delete,deleteBy,deleteFirstsBy,denominator,%
1439        digitToInt,div,divMod,drop,dropWhile,either,elem,elems,elemIndex,%
1440        elemIndices,encodeFloat,enumFrom,enumFromThen,enumFromThenTo,%
1441        enumFromTo,error,even,exitFailure,exitWith,exp,exponent,fail,%
1442        filter,filterM,find,findIndex,findIndices,flip,floatDigits,%
1443        floatRadix,floatRange,floatToDigits,floor,foldl,foldM,foldl1,%
1444        foldr,foldr1,fromDouble,fromEnum,fromInt,fromInteger,%
1445        fromIntegral,fromJust,fromMaybe,fromRat,fromRational,%
1446        fromRealFrac,fst,gcd,genericLength,genericTake,genericDrop,%
1447        genericSplitAt,genericIndex,genericReplicate,getArgs,getChar,%
1448        getContents,getEnv,getLine,getProgName,getStdGen,getStdRandom,%
1449        group,groupBy,guard,hClose,hFileSize,hFlush,hGetBuffering,%
1450        hGetChar,hGetContents,hGetLine,hGetPosn,hIsClosed,hIsEOF,hIsOpen,%
1451        hIsReadable,hIsSeekable,hIsWritable,hLookAhead,hPutChar,hPutStr,%
1452        hPutStrLn,hPrint,hReady,hSeek,hSetBuffering,hSetPosn,head,%
1453        hugsIsEOF,hugsHIsEOF,hugsIsSearchErr,hugsIsNameErr,%
1454        hugsIsWriteErr,id,ioError,imagPart,index,indices,init,inits,%
1455        inRange,insert,insertBy,interact,intersect,intersectBy,%
1456        intersperse,intToDigit,ioeGetErrorString,ioeGetFileName,%
1457        ioeGetHandle,isAlreadyExistsError,isAlreadyInUseError,isAlpha,%
1458        isAlphaNum,isAscii,isControl,isDenormalized,isDoesNotExistError,%
1459        isDigit,isEOF,isEOFError,isFullError,isHexDigit,isIEEE,%
1460        isIllegalOperation,isInfinite,isJust,isLower,isNaN,%
1461        isNegativeZero,isNothing,isOctDigit,isPermissionError,isPrefixOf,%
1462        isPrint,isSpace,isSuffixOf,isUpper,isUserError,iterate,ixmap,%
1463        join,last,lcm,length,lex,lexDigits,lexLitChar,liftM,liftM2,%
1464        liftM3,liftM4,liftM5,lines,listArray,listToMaybe,log,logBase,%
1465        lookup,magnitude,makePolar,map,mapAccumL,mapAccumR,mapAndUnzipM,%
1466        mapM,mapM_,mapMaybe,max,maxBound,maximum,maximumBy,maybe,%
1467        maybeToList,min,minBound,minimum,minimumBy,mkPolar,mkStdGen,%
1468        mplus,mod,msum,mzero,negate,next,newStdGen,not,notElem,nub,nubBy,%
1469        null,numerator,odd,openFile,or,ord,otherwise,partition,phase,pi,%
1470        polar,pred,print,product,properFraction,putChar,putStr,putStrLn,%
1471        quot,quotRem,random,randomIO,randomR,randomRIO,randomRs,randoms,%
1472        rangeSize,read,readDec,readFile,readFloat,readHex,readInt,readIO,%
1473        readList,readLitChar,readLn,readParen,readOct,readSigned,reads,%
1474        readsPrec,realPart,realToFrac,recip,rem,repeat,replicate,return,%
1475        reverse,round,scaleFloat,scanl,scanl1,scanr,scanr1,seq,sequence,%
1476        sequence_,setStdGen,show,showChar,showEFloat,showFFloat,%
1477        showFloat,showGFloat,showInt,showList,showLitChar,showParen,%
1478        showSigned,showString,shows,showsPrec,significand,signum,sin,%
1479        sinh,snd,sort,sortBy,span,split,splitAt,sqrt,stderr,stdin,stdout,%
1480        strict,subtract,succ,sum,system,tail,tails,take,takeWhile,tan,%
1481        tanh,toEnum,toInt,toInteger,toLower,toRational,toUpper,transpose,%
1482        truncate,try,uncurry,undefined,unfoldr,union,unionBy,unless,%
1483        unlines,until,unwords,unzip,unzip3,unzip4,unzip5,unzip6,unzip7,%
1484        userError,when,words,writeFile,zero,zip,zip3,zip4,zip5,zip6,zip7,%
1485        zipWith,zipWithM,zipWithM_,zipWith3,zipWith4,zipWith5,zipWith6,%
1486        zipWith7},%
1487   sensitive,%
1488   morecomment=[l]--,%
1489   morecomment=[n]{\{-}{-\}},%
```

```
1490    morestring=[b]"%
1491    }[keywords,comments,strings]%
```

1492 ⟨/lang2⟩

2.31   HTML

I'm quite the opposite of a HTML wizard. In particular this is true for the defined keywords. Matthias Bethke helped me out and extended the list.

1493 ⟨*lang1⟩

```
1494 \lst@definelanguage{HTML}%
1495    {morekeywords={A,ABBR,ACRONYM,ADDRESS,APPLET,AREA,B,BASE,BASEFONT,%
1496        BDO,BIG,BLOCKQUOTE,BODY,BR,BUTTON,CAPTION,CENTER,CITE,CODE,COL,%
1497        COLGROUP,DD,DEL,DFN,DIR,DIV,DL,DOCTYPE,DT,EM,FIELDSET,FONT,FORM,%
1498        FRAME,FRAMESET,HEAD,HR,H1,H2,H3,H4,H5,H6,HTML,I,IFRAME,IMG,INPUT,%
1499        INS,ISINDEX,KBD,LABEL,LEGEND,LH,LI,LINK,LISTING,MAP,META,MENU,%
1500        NOFRAMES,NOSCRIPT,OBJECT,OPTGROUP,OPTION,P,PARAM,PLAINTEXT,PRE,%
1501        OL,Q,S,SAMP,SCRIPT,SELECT,SMALL,SPAN,STRIKE,STRING,STRONG,STYLE,%
1502        SUB,SUP,TABLE,TBODY,TD,TEXTAREA,TFOOT,TH,THEAD,TITLE,TR,TT,U,UL,%
1503        VAR,XMP,%
1504        accesskey,action,align,alink,alt,archive,axis,background,bgcolor,%
1505        border,cellpadding,cellspacing,charset,checked,cite,class,classid,%
1506        code,codebase,codetype,color,cols,colspan,content,coords,data,%
1507        datetime,defer,disabled,dir,event,error,for,frameborder,headers,%
1508        height,href,hreflang,hspace,http-equiv,id,ismap,label,lang,link,%
1509        longdesc,marginwidth,marginheight,maxlength,media,method,multiple,%
1510        name,nohref,noresize,noshade,nowrap,onblur,onchange,onclick,%
1511        ondblclick,onfocus,onkeydown,onkeypress,onkeyup,onload,onmousedown,%
1512        profile,readonly,onmousemove,onmouseout,onmouseover,onmouseup,%
1513        onselect,onunload,rel,rev,rows,rowspan,scheme,scope,scrolling,%
1514        selected,shape,size,src,standby,style,tabindex,text,title,type,%
1515        units,usemap,valign,value,valuetype,vlink,vspace,width,xmlns},%
1516    tag=**[s]<>,%
1517    sensitive=f,%
1518    morestring=[d]",% ??? doubled
```

Now we take care of comments. We don't enter comment mode if we aren't inside <>.

```
1519    MoreSelectCharTable=%
1520        \lst@CArgX--\relax\lst@DefDelimB{}{}%
1521            {\ifnum\lst@mode=\lst@tagmode\else
1522                \expandafter\@gobblethree
1523             \fi}%
1524        \lst@BeginComment\lst@commentmode{{\lst@commentstyle}}%
1525        \lst@CArgX--\relax\lst@DefDelimE{}{}{}%
1526        \lst@EndComment\lst@commentmode
1527    }[keywords,comments,strings,html]%
```

Peter Biechele reported a problem which was due to missing `\@empty` in value of `SelectCharTable`. And after receiving a bug report from Jochen Schneider I converted the version 0.21 contents of `MoreSelectCharTable` to version 1.0.

1528 ⟨/lang1⟩

2.32 IDL

The definition is from Jürgen Heim.

```
1529 ⟨*lang2⟩

1530 %%
1531 %% IDL definition (c) 1998 Juergen Heim
1532 %%
1533 \lst@definelanguage{IDL}%
1534   {morekeywords={and,begin,case,common,do,else,end,endcase,endelse,%
1535     endfor,endif,endrep,endwhile,eq,for,function,ge,goto,gt,if,le,lt,%
1536     mod,ne,not,of,on_ioerror,or,pro,repeat,return,then,until,while,%
1537     xor,on_error,openw,openr,openu,print,printf,printu,plot,read,%
1538     readf,readu,writeu,stop},%
1539   sensitive=f,%
1540   morecomment=[l];,%
1541   morestring=[d]'%
1542   }[keywords,comments,strings]%

1543 ⟨/lang2⟩
```

2.33 Inform

Thanks to Jonathan Sauer for this language definition. Ulrike Fischer pointed out that \lstdefinelanguage should be \lst@definelanguage.

```
1544 ⟨*lang2⟩

1545 %%
1546 %% Inform definition (c) 2003 Jonathan Sauer
1547 %%
1548 \lst@definelanguage{inform}{%
1549   % Language keywords
1550   morekeywords={breakdo,else,false,for,has,hasnt,if,%
1551     in,indirect,jump,notin,nothing,NULL,objectloop,ofclass,%
1552     private,property,provides,return,rfalse,rtrue,self,string,%
1553     switch,to,true,until,while,with,%
1554     creature,held,multiexcept,multiheld,multiinside,noun,number,%
1555     scope,topic},%
1556   %
1557   % Inform functions
1558   morekeywords=[2]{box,child,children,font,give,inversion,metaclass,move,%
1559     new_line,parent,print,print_ret,read,remove,restore,sibling,%
1560     save,spaces,quit,style,bold,underline,reverse,roman remaining,%
1561     create,destroy,recreate,copy},%
1562   %
1563   % Inform definitions
1564   morekeywords=[3]{Attribute,Array,Class,Constant,Default,End,Endif,Extend,%
1565     Global,Ifdef,Iffalse,Ifndef,Ifnot,Iftrue,Include,Object,%
1566     Property,Verb,Release,Serial,Statusline},%
1567   %
1568   % Library attributes
1569   morekeywords=[4]{absent,animate,clothing,concealed,container,door,edible,%
1570     enterable,female,general,light,lockable locked,male,moved,%
1571     neuter,on,open,openable,pluralname,proper,scenery,scored,%
1572     static,supporter,switchable,talkable,transparent,visited,%
```

38

```
1573      workflag,worn},%
1574    %
1575    % Library properties
1576    morekeywords=[5]{n_to,s_to,e_to,w_to,ne_to,nw_to,se_to,sw_to,in_to,%
1577      out_to,u_to,d_to,add_to_scope,after,article,articles,before,%
1578      cant_go,capacity,daemon,describe,description,door_dir,door_to,%
1579      each_turn,found_in,grammar,initial,inside_description,invent,%
1580      life,list_together,name number,orders,parse_name,plural,%
1581      react_after,react_before,short_name,short_name_indef,time_left,%
1582      time_out,when_closed,when_open,when_on,when_off,%
1583      with_key},%
1584    %
1585    % Library routines
1586    morekeywords=[6]{Achieved,AfterRoutines,AllowPushDir,Banner,ChangePlayer,%
1587      CommonAncestor,DictionaryLookup,GetGNAOfObject,HasLightSource,%
1588      IndirectlyContains,IsSeeThrough,Locale,LoopOverScope,LTI_Insert,%
1589      MoveFloatingObjects,NextWord,NextWordStopped,NounDomain,%
1590      ObjectIsUntouchable OffersLight,ParseToken,PlaceInScope,PlayerTo,%
1591      PronounNotice,PronounValue,ScopeWithin,SetPronoun,SetTime,%
1592      StartDaemon,StartTimer,StopDaemon,StopTimer,TestScope,TryNumber,%
1593      UnsignedCompare,WordAddress,WordInProperty,WordLength,%
1594      WriteListFrom,YesOrNo},%
1595    %
1596    % Library,entry points
1597    morekeywords=[7]{AfterLife,AfterPrompt,Amusing,BeforeParsing,ChooseObjects,%
1598      DarkToDark,DeathMessage,GamePostRoutine GamePreRoutine,%
1599      Initialise,InScope,LookRoutine,NewRoom,ParseNoun,ParseNumber,%
1600      ParserError,PrintRank,PrintTaskName,PrintVerb,TimePasses,%
1601      UnknownVerb},%
1602    %
1603    % Library constants
1604    morekeywords=[8]{NEWLINE_BIT,INDENT_BIT,FULLINV_BIT,ENGLISH_BIT,%
1605      RECURSE_BIT,ALWAYS_BIT,TERSE_BIT,PARTINV_BIT,DEFART_BIT,%
1606      WORKFLAG_BIT,ISARE_BIT,CONCEAL_BIT},%
1607    %
1608    % Library,meta actions
1609    morekeywords=[9]{Pronouns,Quit,Restart,Restore,Save,Verify,ScriptOn,%
1610      ScriptOff,NotifyOn,NotifyOff,Places,Objects,Score,FullScore,Version,%
1611      LMode1,LMode2,LMode3},%
1612    %
1613    % Library,main actions
1614    morekeywords=[10]{Close,Disrobe,Drop,Eat,Empty,EmptyT,Enter,Examine,%
1615      Exit,GetOff,Give,Go,GoIn,Insert,Inv,InvTall,InvWide,Lock,Look,Open,%
1616      PutOn,Remove,Search,Show,SwitchOff,SwitchOn,Take,Transfer,%
1617      Unlock VagueGo, Wear},%
1618    %
1619    % Library,stub actions
1620    morekeywords=[11]{Answer,Ask,AskFor,Attack,Blow,Burn,Buy,Climb,%
1621      Consult,Cut,Dig,Drink,Fill,Jump,JumpOver,Kiss,Listen,LookUnder,%
1622      Mild,No,Pray,Pull,Push,PushDir,Rub,Set,SetTo,Sing,Sleep,Smell,%
1623      Sleep,Smell,Sorry,Squeeze,Strong,Swim,Swing,Taste,Tell,Think,%
1624      ThrowAt,Tie,Touch,Turn,
1625      Wait,Wake,WakeOther,Wave,WaveHands,Yes},%
1626    %
```

```
1627   otherkeywords={->,-->},%
1628   sensitive=false,%
1629   morestring=[d]{"},%
1630   morecomment=[l]{!}%
1631 }[keywords,comments,strings]%

1632 ⟨/lang2⟩
```

2.34   Java and other JVM based languages

Robert Wenner sent in the first of the following two definitions.

```
1633 ⟨*lang1⟩

1634 %%
1635 %% AspectJ definition (c) Robert Wenner
1636 %%
1637 \lst@definelanguage[AspectJ]{Java}[]{Java}%
1638   {morekeywords={%
1639       adviceexecution,after,args,around,aspect,aspectOf,before,%
1640       call,cflow,cflowbelow,%
1641 % declare error,declare parents,declare precedence,
1642 % declare soft,declare warning,
1643       execution,get,handler,if,initialization,issingleton,pointcut,%
1644       percflow,percflowbelow,perthis,pertarget,preinitialization,%
1645       privileged,proceed,returning,set,staticinitialization,strictfp,%
1646       target,this,thisEnclosingJoinPoint,thisJoinPoint,throwing,%
1647       within,withincode},%
1648   MoreSelectCharTable=%
1649     \lst@DefSaveDef{`.}\lst@umdot{\lst@umdot\global\let\lst@derefop\@empty}%
1650     \ifx\lst@derefinstalled\@empty\else
1651       \global\let\lst@derefinstalled\@empty
1652 \lst@AddToHook{Output}%
1653 {\lst@ifkeywords
1654     \ifx\lst@derefop\@empty
1655       \global\let\lst@derefop\relax
1656       \ifx\lst@thestyle\lst@gkeywords@sty
1657         \ifx\lst@currstyle\relax
1658           \let\lst@thestyle\lst@identifierstyle
1659         \else
1660           \let\lst@thestyle\lst@currstyle
1661         \fi
1662      \fi
1663    \fi
1664  \fi}
1665 \lst@AddToHook{BOL}{\global\let\lst@derefop\relax}%
1666 \lst@AddTo\lst@ProcessSpace{\global\let\lst@derefop\relax}%
1667    \fi
1668   }%

1669 ⟨/lang1⟩
```

Got data from `http://java.sun.com`.

```
1670 ⟨*lang1⟩

1671 \lst@definelanguage{Java}%
1672   {morekeywords={abstract,boolean,break,byte,case,catch,char,class,%
```

```
1673        const,continue,default,do,double,else,extends,false,final,%
1674        finally,float,for,goto,if,implements,import,instanceof,int,%
1675        interface,label,long,native,new,null,package,private,protected,%
1676        public,return,short,static,super,switch,synchronized,this,throw,%
1677        throws,transient,true,try,void,volatile,while},%
1678     sensitive,%
1679     morecomment=[l]//,%
1680     morecomment=[s]{/*}{*/},%
1681     morestring=[b]",%
1682     morestring=[b]',%
1683    }[keywords,comments,strings]%
```

Herbert Voss added the keyword `label`.

```
1684 ⟨/lang1⟩
```

Martine Gautier made the following contribution.

```
1685 ⟨*lang1⟩
```

```
1686 %%
1687 %% ByteCodeJava definition (c) 2004 Martine Gautier
1688 %%
1689 \lst@definelanguage{JVMIS}%
1690    {morekeywords={aaload,astore,aconst_null,aload,aload_0,aload_1,%
1691        aload_2,aload_3,anewarray,areturn,arraylength,astore,astore_0,%
1692        astore_1,astore_2,astore_3,athrow,baload,bastore,bipush,caload,%
1693        castore,checkcast,d2f,d2i,d2l,dadd,daload,dastore,dcmpg,dcmpl,%
1694        dconst_0,dconst_1,ddiv,dload,dload_0,dload_1,dload_2,dload_3,%
1695        dmul,dneg,drem,dreturn,dstore,dstore_0,dstore_1,dstore_2,%
1696        dstore_3,dsub,dup,dup_x1,dup_x2,dup2,dup2_x1,dup2_x2,f2d,%
1697        f2i,f2l,fadd,faload,fastore,fcmpg,fcmpl,fconst_0,fconst_1,%
1698        fconst_2,fdiv,fload,fload_0,fload_1,fload_2,fload_3,fmul,%
1699        fneg,frem,freturn,fstore,fstore_0,fstore_1,fstore_2,fstore_3,%
1700        fsub,getfield,getstatic,goto,goto_w,i2b,i2c,i2d,i2f,i2l,i2s,%
1701        iadd,iaload,iand,iastore,iconst_0,iconst_1,iconst_2,iconst_3,%
1702        iconst_4,iconst_5,idiv,if_acmpeq,if_acmpne,if_icmpeq,if_icmpne,%
1703        if_icmplt,if_cmpge,if_cmpgt,if_cmple,ifeq,ifne,iflt,ifge,ifgt,%
1704        ifle,ifnonnull,ifnull,iinc,iload,iload_0,iload_1,iload_2,%
1705        iload_3,imul,ineg,instanceof,invokeinterface,invokespecial,%
1706        invokestatic,invokevirtual,ior,irem,ireturn,ishl,ishr,istore,%
1707        istore_0,istore_1,istore_2,istore_3,isub,iushr,ixor,jsr,jsr_w,%
1708        l2d,l2f,l2i,ladd,laload,land,lastore,lcmp,lconst_0,lconst_1,%
1709        ldc,ldc_w,ldc2_w,ldiv,lload,lload_0,lload_1,lload_2,lload_3,%
1710        lmul,lneg,lookupswitch,lor,lrem,lreturn,lshl,lshr,lstore,%
1711        lstore_0,lstore_1,lstore_2,lstore_3,lsub,lushr,lxor,%
1712        monitorenter,monitorexit,multianewarray,new,newarray,nop,pop,%
1713        pop2,putfield,putstatic,ret,return,saload,sastore,sipush,swap,%
1714        tableswitch,wide,limit,locals,stack},%
1715    }[keywords]%
```

```
1716 ⟨/lang1⟩
```

2.34.1   Scala

Bastian Germann asked to include the Scala definition provided by Frank Teubler (2009). Here it is:

```
1717 ⟨*lang3⟩
```

```
1718 \lst@definelanguage{Scala}%
1719   {morekeywords={abstract,case,catch,class,def,%
1720     do,else,extends,false,final,finally,%
1721     for,if,implicit,import,lazy,match,mixin,%
1722     new,null,object,override,package,%
1723     private,protected,requires,return,sealed,%
1724     super,this,trait,true,try,%
1725     type,val,var,while,with,yield},%+
1726 % otherkeywords={_,:,=,=>,<<:,<\%,>:,\#,@},%
1727 otherkeywords={=,=>,<-,<\%,<:,>:,\#,@},%
1728     sensitive,%
1729     morecomment=[l]//,%
1730     morecomment=[n]{/*}{*/},%
1731     morestring=[b]",%
1732     morestring=[b]',%
1733     morestring=[b]""",%
1734   }[keywords,comments,strings]%

1735 ⟨/lang3⟩
```

2.35 ksh

Thanks to Jeffrey Ratcliffe for this language definition.

1736 ⟨∗lang3⟩

```
1737 \lst@definelanguage{ksh}
1738   {morekeywords={alias,awk,cat,echo,else,elif,fi,exec,exit,%
1739       for,in,do,done,select,case,esac,while,until,function,%
1740       time,export,cd,eval,fc,fg,kill,let,pwd,read,return,rm,%
1741       glob,goto,history,if,logout,nice,nohup,onintr,repeat,sed,%
1742       set,setenv,shift,source,switch,then,umask,unalias,%
1743       unset,wait,@,env,argv,child,home,ignoreeof,noclobber,%
1744       noglob,nomatch,path,prompt,shell,status,verbose,print,printf,%
1745       sqrt,BEGIN,END},%
1746     morecomment=[l]\#,%
1747     morestring=[d]",%
1748     morestring=[d]',%
1749     morestring=[d]`%
1750   }[keywords,comments,strings]%
1751 %     \begin{macrocode}
1752 ⟨/lang3⟩
```

Herbert Voss suggested to add the string delimiter '.

2.36 Lingo

Thanks to Mark Schade for this language definition.

1753 ⟨∗lang3⟩

```
1754 \lst@definelanguage{Lingo}{%
1755   morekeywords={abort, after, and, before, do, down, halt, me, new, not,%
1756     of, on, or, otherwise, pass, put, result, return, set, tell, the, then,%
1757     to, with, repeat, while, case, if, else, true, false, global, property,%
1758     \_global, \_key, \_mouse, \_movie, \_player, \_sound, \_system, abbr,%
1759     abbrev, abbreviated, abs, actionsenabled, activateapplication,%
```

```
1760    activatewindow, active3drenderer, activecastlib, activewindow,%
1761    actorlist, add, addat, addbackdrop, addcamera, addchild, addmodifier,%
1762    addoverlay, addprop, addtoworld, addvertex, alert, alerthook,%
1763    alignment, allowcustomcaching, allowgraphicmenu, allowsavelocal,%
1764    allowtransportcontrol, allowvolumecontrol, allowzooming,%
1765    alphathreshold, ambient, ambientcolor, ancestor, angle, anglebetween,%
1766    animationenabled, antialias, antialiasthreshold, append,%
1767    applicationname, applicationpath, appminimize, atan, attenuation,%
1768    attributevalue, auto, autoblend, automask, autotab, axisangle, back,%
1769    backcolor, backdrop, backgroundcolor, backspace, beep, beepon,%
1770    beginrecording, beginsprite, beveldepth, beveltype, bgcolor, bias,%
1771    bitand, bitmap, bitmapsizes, bitnot, bitor, bitrate, bitspersample,%
1772    bitxor, blend, blendconstant, blendconstantlist, blendfactor,%
1773    blendfunction, blendfunctionlist, blendlevel, blendrange, blendsource,%
1774    blendsourcelist, blendtime, bone, bonesplayer, border, both, bottom,%
1775    bottomcap, bottomradius, bottomspacing, boundary, boundingsphere, box,%
1776    boxdropshadow, boxtype, breakconnection, breakloop, brightness,%
1777    broadcastprops, browsername, buffersize, build, buttonsenabled,%
1778    buttonstyle, buttontype, bytesstreamed, boolean, cachedocverify,%
1779    cachesize, call, callancestor, camera, cameracount, cameraposition,%
1780    camerarotation, cancelidleload, castlib, castlibnum, castmemberlist,%
1781    center, centerregpoint, centerstage, changearea, channelcount, char,%
1782    characterset, charpostoloc, chars, charspacing, chartonum,%
1783    checkboxaccess, checkboxtype, checkmark, checknetmessages, child,%
1784    chunksize, clearatrender, clearcache, clearerror, clearframe,%
1785    clearglobals, clearvalue, clickloc, clickmode, clickon, clone,%
1786    clonedeep, clonemodelfromcastmember, clonemotionfromcastmember, close,%
1787    closed, closewindow, closexlib, collision, collisiondata,%
1788    collisionnormal, color, world, colorbuffer, colorbufferdepth,%
1789    colordepth, colorlist, colorrange, colors, colorsteps, commanddown,%
1790    comments, compressed, connecttonetserver, constrainh, constraint,%
1791    constrainv, continue, controldown, controller, copypixels,%
1792    copyrightinfo, copyto, copytoclipboard, cos, count, cpuhogticks,%
1793    creaseangle, creases, [contains], createfolder, createmask,%
1794    creatematte, creationdate, creator, crop, cross, crossproduct,%
1795    cuepassed, cuepointnames, cuepointtimes, currentloopstate,%
1796    currentspritenum, currenttime, cursor, cursorsize, curve, cylinder,%
1797    ate, day, deactivateapplication, deactivatewindow, debug,%
1798    debugplaybackenabled, decaymode, defaultrect, defaultrectmode, delay,%
1799    delete, deleteall, deleteat, deletecamera, deletefolder, deleteframe,%
1800    deletegroup, deletelight, deletemodel, deletemodelresource,%
1801    deletemotion, deleteone, deleteprop, deleteshader, deletetexture,%
1802    deletevertex, density, depth, depthbufferdepth, desktoprectlist,%
1803    diffuse, diffusecolor, diffuselightmap, digitalvideotimescale,%
1804    digitalvideotype, direction, directionalcolor, directionalpreset,%
1805    directtostage, disableimagingtransformation, displayface, displaymode,%
1806    distanceto, distribution, dither, done, doneparsing, dot, dotproduct,%
1807    doubleclick, downloadnetthing, drag, draw, drawrect, dropshadow,%
1808    duplicate, duplicateframe, duration, editable, editshortcutsenabled,%
1809    elapsedtime, emissive, emitter, empty, emulatemultibuttonmouse,%
1810    enabled, enablehotspot, end, endangle, endcolor, endframe,%
1811    endrecording, endsprite, endtime, enter, enterframe, environment,%
1812    erase, error, eventpassmode, exchange, exists, exit, exitframe,%
1813    exitlock, exp, externalevent, externalparamcount, externalparamname,%
```

43

```
1814    externalparamvalue, extractalpha, extrude3d, face, fadein, fadeout,%
1815    fadeto, far, field, fieldofview, filename, fill, fillcolor, fillcycles,%
1816    filldirection, filled, fillmode, filloffset, fillscale, findempty,%
1817    findlabel, findpos, findposnear, finishidleload, firstindent,%
1818    fixedlinespace, fixedrate, fixstagesize, flashrect, flashtostage, flat,%
1819    fliph, flipv, float, floatp, floatprecision, flush, flushinputevents,%
1820    fog, folderchar, font, fontsize, fontstyle, forecolor, forget, frame,%
1821    framecount, framelabel, framepalette, framerate, frameready,%
1822    framescript, framesound1, framesound2, framestohms, frametempo,%
1823    frametransition, freeblock, freebytes, fromcastmember, fromimageobject,%
1824    front, frontwindow, generatenormals, getaprop, getat,%
1825    getbehaviordescription, getbehaviortooltip, getboneid, geterror,%
1826    geterrorstring, gethardwareinfo, gethotspotrect, getlast,%
1827    getlatestnetid, getnetaddresscookie, getneterrorstring, getnetmessage,%
1828    getnetoutgoingbytes, getnettext, getnormalized, getnthfilenameinfolder,%
1829    getnumberwaitingnetmessages, getone, getpeerconnectionlist, getpixel,%
1830    getplaylist, getpos, getpref, getprop, getpropat,%
1831    getpropertydescriptionlist, getrendererservices, getstreamstatus,%
1832    gettemppath, getworldtransform, globals, glossmap, go, gotoframe,%
1833    gotonetmovie, gotonetpage, gradienttype, gravity, group, handler,%
1834    handlers, height, heightvertices, high, highlightpercentage,%
1835    highlightstrength, hilite, hither, hittest, hmstoframes, hold, hotspot,%
1836    html, hyperlink, hyperlinkclicked, hyperlinkrange, hyperlinks,%
1837    hyperlinkstate, id3tags, identity, idle, idlehandlerperiod,%
1838    idleloaddone, idleloadmode, idleloadperiod, idleloadtag,%
1839    idlereadchunksize, ilk, image, imagecompression, imageenabled,%
1840    imagequality, immovable, importfileinto, inflate, ink, inker,%
1841    inlineimeenabled, insertbackdrop, insertframe, insertoverlay, inside,%
1842    installmenu, instance, integer, integerp, interface, interpolate,%
1843    interpolateto, intersect, index, interval, inverse, invert, invertmask,%
1844    isbusy, isinworld, isoktoattach, ispastcuepoint, item, itemdelimiter,%
1845    kerning, kerningthreshold, key, keyboardfocussprite, keycode, keydown,%
1846    keydownscript, keyframeplayer, keypressed, keyup, keyupscript, label,%
1847    labellist, last, lastchannel, lastclick, lastevent, lastframe, lastkey,%
1848    lastroll, left, leftindent, length, lengthvertices, level, lifetime,%
1849    light, line, linearlist, linecolor, linecount, linedirection,%
1850    lineheight, lineoffset, linepostolocv, linesize, linkas, linked, list,%
1851    listp, loaded, loadfile, loc, loch, locked, locktranslation,%
1852    loctocharpos, locv, locvtolinepos, locz, lod, log, long, loop,%
1853    loopcount, loopendtime, loopsremaining, loopstarttime, machinetype,%
1854    magnitude, map, mapImageToStage, mapmembertostage, mapstagetomember,%
1855    margin, marker, markerlist, mask, max, maxinteger, maxspeed, mci,%
1856    media, mediaready, member, membernum, members, memorysize, menu, mesh,%
1857    meshdeform, milliseconds, min, minspeed, modal, mode, model, modela,%
1858    modelb, modelresource, modelsunderloc, modelsunderray, modelunderloc,%
1859    modified, modifiedby, modifieddate, modifier, modifiers, month,%
1860    mostrecentcuepoint, motion, mousechar, mousedown, mousedownscript,%
1861    mouseenter, mouseh, mouseitem, mouseleave, mouselevel, mouseline,%
1862    mouseloc, mousemember, mouseoverbutton, mouseup, mouseupoutside,%
1863    mouseupscript, mousev, mousewithin, mouseword, move, moveablesprite,%
1864    movetoback, movetofront, movevertex, movevertexhandle, movewindow,%
1865    movie, movieaboutinfo, moviecopyrightinfo, moviefilefreesize,%
1866    moviefilesize, moviefileversion, movieimagecompression,%
1867    movieimagequality, moviename, moviepath, movierate, movietime,%
```

```
1868    moviextralist, mpeglayer, multiply, multisound, name, near,%
1869    nearfiltering, neighbor, netabort, netdone, neterror, netlastmoddate,%
1870    netmime, netpresent, netstatus, nettextresult, netthrottleticks,%
1871    newcamera, newcurve, newgroup, newlight, newmesh, newmodel,%
1872    newmodelresource, newmotion, newshader, newtexture, next, none,%
1873    normalize, normallist, normals, nothing, notify, nudge, number,%
1874    numchannels, numparticles, numsegments, numtochar, objectp, offset,%
1875    open, openresfile, openwindow, openxlib, optiondown, organizationname,%
1876    originalfont, originh, originmode, originpoint, originv, orthoheight,%
1877    overlay, pageheight, palette, palettemapping, paletteref, paletteindex,%
1878    pan, paragraph, param, paramcount, parent, parsestring, particle,%
1879    pasteclipboardinto, path, pathname, pathstrength, pattern, pause,%
1880    pausedatstart, pausestate, percentplayed, percentstreamed, period,%
1881    perpendicularto, persistent, pi, picture, picturep, plane, platform,%
1882    play, playbackmode, playfile, playing, playlist, playnext, playrate,%
1883    point, pointat, pointatorientation, pointinhyperlink, pointofcontact,%
1884    pointtochar, pointtoitem, pointtoline, pointtoparagraph, pointtoword,%
1885    position, positionreset, posterframe, postnettext, power,%
1886    preferred3drenderer, preload, preloadbuffer, preloadeventabort,%
1887    preloadmember, preloadmode, preloadmovie, preloadnetthing, preloadram,%
1888    preloadtime, premultiply, prepareframe, preparemovie, prerotate,%
1889    prescale, pretranslate, previous, primitives, printfrom,%
1890    productversion, projection, projectionangle, propList, proxyserver,%
1891    pttohotspotid, puppet, puppetpalette, puppetsound, puppetsprite,%
1892    puppettempo, puppettransition, purgepriority, qtregisteraccesskey,%
1893    qtunregisteraccesskey, quad, quality, queue, quit, quote, radius,%
1894    ramneeded, random, randomseed, randomvector, rateshift, rawnew, read,%
1895    readvalue, recordfont, rect, ref, reflectionmap, reflectivity, region,%
1896    registerforevent, registerscript, regpoint, regpointvertex,%
1897    removebackdrop, removefromworld, removelast, removemodifier,%
1898    removeoverlay, rename, renderer, rendererdevicelist, renderformat,%
1899    renderstyle, resetworld, resizewindow, resolution, resolve, resolvea,%
1900    resolveb, resource, restart, resume, reverttoworlddefaults, rewind,%
1901    rgb, rgba4444, rgba5550, rgba5551, rgba5650, rgba8880, rgba8888, right,%
1902    rightindent, rightmousedown, rightmouseup, rollover, romanlingo,%
1903    rootlock, rootnode, rotate, rotation, rotationreset, rtf, runmode,%
1904    runpropertydialog, safeplayer, samplecount, samplerate, samplesize,%
1905    save, savedlocal, savemovie, scale, scalemode, score, scorecolor,%
1906    scoreselection, script, scriptexecutionstyle, scriptinstancelist,%
1907    scriptlist, scriptnum, scriptsenabled, scripttext, scripttype,%
1908    scrollbyline, scrollbypage, scrolltop, sds, searchcurrentfolder,%
1909    searchpath, searchpaths, seconds, selectedtext, selection, selend,%
1910    selstart, sendallsprites, sendevent, sendnetmessage, sendsprite,%
1911    serialnumber, setalpha, setaprop, setat, setcollisioncallback,%
1912    setflashproperty, setnetbufferlimits, setnetmessagehandler, setpixel,%
1913    setplaylist, setpref, setprop, setscriptlist, settrackenabled,%
1914    setvariable, shader, shaderlist, shadowpercentage, shadowstrength,%
1915    shapetype, shiftdown, shininess, shockwave3d, short, showglobals,%
1916    showlocals, showprops, showresfile, showxlib, shutdown, silhouettes,%
1917    sin, size, sizerange, skew, sleep, smoothness, sort, sound, soundbusy,%
1918    soundchannel, sounddevice, sounddevicelist, soundenabled,%
1919    soundkeepdevice, soundlevel, soundmixmedia, source, sourcerect, space,%
1920    specular, specularcolor, specularlightmap, sphere, spotangle,%
1921    spotdecay, sprite, spritenum, spritespacetoworldspace, sqrt, stage,%
```

```
1922     stagebottom, stagecolor, stageleft, stageright, stagetoflash, stagetop,%
1923     standard, startangle, startframe, startmovie, starttime, starttimer,%
1924     state, static, status, stepframe, stilldown, stop, stopevent,%
1925     stopmovie, stoptime, stream, streammode, streamname, streamsize,%
1926     streamstatus, string, stringp, strokecolor, strokewidth, style,%
1927     subdivision, sweep, swing, switchcolordepth, symbol, symbolp,%
1928     systemdate, tab, tabcount, tabs, tan, target, tellstreamstatus,%
1929     tension, text, texture, texturecoordinatelist, texturecoordinates,%
1930     texturelayer, texturelist, texturemember, texturemode, texturemodelist,%
1931     texturerenderformat, texturerepeat, texturerepeatlist,%
1932     texturetransform, texturetransformlist, texturetype, thumbnail, ticks,%
1933     tilt, time, timeout, timeouthandler, timeoutkeydown, timeoutlapsed,%
1934     timeoutlength, timeoutlist, timeoutmouse, timeoutplay, timeoutscript,%
1935     timer, timescale, title, titlevisible, toon, top, topcap, topradius,%
1936     topspacing, trace, traceload, tracelogfile, trackcount, trackenabled,%
1937     tracknextkeytime, tracknextsampletime, trackpreviouskeytime,%
1938     trackprevioussampletime, trackstarttime, trackstoptime, tracktext,%
1939     tracktype, trails, transform, transitiontype, translate,%
1940     triggercallback, trimwhitespace, tunneldepth, tweened, tweenmode, type,%
1941     [transparent], union, unload, unloadmember, unloadmovie,%
1942     unregisterallevents, update, updateframe, updatelock,%
1943     updatemovieenabled, updatestage, url, usealpha, usediffusewithtexture,%
1944     usefastquads, usehypertextstyles, uselineoffset, userdata, username,%
1945     value, vector, version, vertex, vertexlist, vertices, video,%
1946     videoforwindowspresent, viewh, viewpoint, viewscale, viewv, visibility,%
1947     visible, void, voidp, volume, volumeinfo, wait, waitfornetconnection,%
1948     warpmode, width, widthvertices, wind, window, windowlist,%
1949     windowpresent, windowtype, word, wordwrap, world, worldposition,%
1950     worldspacetospritespace, worldtransform, wraptransform,%
1951     wraptransformlist, write, writevalue, xaxis, xtra, xtralist, xtras,%
1952     yaxis, year, yon, zaxis, zoombox, zoomwindow, repeat, Conditional,%
1953     Boolean, TypeDef, Statement, Operator, String, Comment, Identifier,%
1954     Special, x, y, z},%
1955   sensitive=false,%
1956   morecomment=[l]{--},%
1957   morestring=[b]",%
1958 }[keywords,comments,strings]%
1959 %     \begin{macrocode}
1960 ⟨/lang3⟩
```

2.37 Lisp, AutoLisp and Emacs Lisp (elisp)

Most data are from

- GUY STEELE: **Common Lisp**; Copyright 1990 by Digital Equipment Corporation; ISBN 1-55558-042-4.

Thanks to Aslak Raanes for the 'single comment' delimiters. The keywords are the 'one-word' functions and macros of Common Lisp, i.e. words not containing a minus. But I left out the caaaar, ... functions. If anyone types them in, I'd like to get them. Hilmar Preuße informed about an issue mentioned at https://bugs.debian.org/499422, the issue got corrected.

```
1961 ⟨*lang2⟩
```

```
1962 \lst@definelanguage{Lisp}%
1963   {morekeywords={abort,abs,acons,acos,acosh,adjoin,alphanumericp,alter,%
1964       append,apply,apropos,aref,arrayp,ash,asin,asinh,assoc,atan,atanh,%
1965       atom,bit,boole,boundp,break,butlast,byte,catenate,ceiling,cerror,%
1966       char,character,characterp,choose,chunk,cis,close,clrhash,coerce,%
1967       collect,commonp,compile,complement,complex,complexp,concatenate,%
1968       conjugate,cons,consp,constantp,continue,cos,cosh,cotruncate,%
1969       count,delete,denominator,describe,directory,disassemble,%
1970       documentation,dpb,dribble,ed,eighth,elt,enclose,endp,eq,eql,%
1971       equal,equalp,error,eval,evalhook,evenp,every,exp,expand,export,%
1972       expt,fboundp,fceiling,fdefinition,ffloor,fifth,fill,find,first,%
1973       float,floatp,floor,fmakunbound,format,fourth,fround,ftruncate,%
1974       funcall,functionp,gatherer,gcd,generator,gensym,gentemp,get,getf,%
1975       gethash,identity,imagpart,import,inspect,integerp,intern,%
1976       intersection,tively,isqrt,keywordp,last,latch,lcm,ldb,ldiff,%
1977       length,list,listen,listp,load,log,logand,logbitp,logcount,logeqv,%
1978       logior,lognand,lognor,lognot,logtest,logxor,macroexpand,%
1979       makunbound,map,mapc,mapcan,mapcar,mapcon,maphash,mapl,maplist,%
1980       mask,max,member,merge,min,mingle,minusp,mismatch,mod,namestring,%
1981       nbutlast,nconc,nintersection,ninth,not,notany,notevery,nreconc,%
1982       nreverse,nsublis,nsubst,nth,nthcdr,null,numberp,numerator,nunion,%
1983       oddp,open,packagep,pairlis,pathname,pathnamep,phase,plusp,%
1984       position,positions,pprint,previous,princ,print,proclaim,provide,%
1985       random,rassoc,rational,rationalize,rationalp,read,readtablep,%
1986       realp,realpart,reduce,rem,remhash,remove,remprop,replace,require,%
1987       rest,revappend,reverse,room,round,rplaca,rplacd,sbit,scan,schar,%
1988       search,second,series,set,seventh,shadow,signal,signum,sin,sinh,%
1989       sixth,sleep,some,sort,split,sqrt,streamp,string,stringp,sublis,%
1990       subseq,subseries,subsetp,subst,substitute,subtypep,svref,sxhash,%
1991       symbolp,tailp,tan,tanh,tenth,terpri,third,truename,truncate,%
1992       typep,unexport,unintern,union,until,values,vector,vectorp,warn,%
1993       write,zerop,and,assert,case,ccase,cond,ctypecase,decf,declaim,%
1994       defclass,defconstant,defgeneric,defmacro,defmethod,defpackage,%
1995       defparameter,defsetf,defstruct,deftype,defun,defvar,do,dolist,%
1996       dotimes,ecase,encapsulated,etypecase,flet,formatter,gathering,%
1997       incf,iterate,labels,let,locally,loop,macrolet,mapping,or,pop,%
1998       producing,prog,psetf,psetq,push,pushnew,remf,return,rotatef,%
1999       setf,shiftf,step,time,trace,typecase,unless,untrace,when},%
2000     sensitive=false,% ???
2001     alsodigit=-,%
2002     morecomment=[l];,%
2003     morecomment=[s]{\#|}{|\#},% 1997 Aslak Raanes
2004     morestring=[b]"%
2005   }[keywords,comments,strings]%
```

2006 ⟨/lang2⟩

2007 ⟨∗lang2⟩

Stefan Lagotzki warned me to define this as a lisp dialect ...

```
2008 %%
2009 %% AutoLISP/VisualLISP - Stefan Lagotzki, info@lagotzki.de
2010 %%
2011 \lst@definelanguage[Auto]{Lisp}%
2012   {morekeywords={abs,acad_colordlg,acad_helpdlg,acad_strlsort,%
2013       action_tile,add_list,alert,alloc,and,angle,angtof,angtos,append,%
```

```
2014     apply,arx,arxload,arxunload,ascii,assoc,atan,atof,atoi,atom,%
2015     atoms-family,autoarxload,autoload,Boole,boundp,caddr,cadr,car,%
2016     cdr,chr,client_data_tile,close,command,cond,cons,cos,cvunit,%
2017     defun,defun-q,defun-q-list-ref,defun-q-list-set,dictadd,dictnext,%
2018     dictremove,dictrename,dictsearch,dimx_tile,dimy_tile,distance,%
2019     distof,done_dialog,end_image,end_list,entdel,entget,entlast,%
2020     entmake,entmakex,entmod,entnext,entsel,entupd,eq,equal,*error*,%
2021     eval,exit,exp,expand,expt,fill_image,findfile,fix,float,foreach,%
2022     function,gc,gcd,get_attr,get_tile,getangle,getcfg,getcname,%
2023     getcorner,getdist,getenv,getfiled,getint,getkword,getorient,%
2024     getpoint,getreal,getstring,getvar,graphscr,grclear,grdraw,grread,%
2025     grtext,grvecs,handent,help,if,initdia,initget,inters,itoa,lambda,%
2026     last,layoutlist,length,list,listp,load,load_dialog,log,logand,%
2027     logior,lsh,mapcar,max,mem,member,menucmd,menugroup,min,minusp,%
2028     mode_tile,namedobjdict,nentsel,nentselp,new_dialog,not,nth,%
2029     null,numberp,open,or,osnap,polar,prin1,princ,print,progn,prompt,%
2030     quit,quote,read,read-char,read-line,redraw,regapp,rem,repeat,%
2031     reverse,rtos,set,set_tile,setcfg,setenv,setfunhelp,setq,%
2032     setvar,setview,sin,slide_image,snvalid,sqrt,ssadd,ssdel,ssget,%
2033     ssgetfirst,sslength,ssmemb,ssname,ssnamex,sssetfirst,startapp,%
2034     start_dialog,start_image,start_list,strcase,strcat,strlen,subst,%
2035     substr,tablet,tblnext,tblobjname,tblsearch,term_dialog,terpri,%
2036     textbox,textpage,textscr,trace,trans,type,unload_dialog,untrace,%
2037     vector_image,ver,vl-acad-defun,vl-acad-undefun,vl-arx-import,%
2038     vl-bb-ref,vl-bb-set,vl-catch-all-apply,%
2039     vl-catch-all-error-message,vl-catch-all-error-p,vl-cmdf,vl-consp,%
2040     vl-directory-files,vl-doc-export,vl-doc-import,vl-doc-ref,%
2041     vl-doc-set,vl-every,vl-exit-with-error,vl-exit-with-value,%
2042     vl-file-copy,vl-file-delete,vl-file-directory-p,vl-file-rename,%
2043     vl-file-size,vl-file-systime,vl-filename-base,%
2044     vl-filename-directory,vl-filename-extension,vl-filename-mktemp,%
2045     vl-get-resource,vl-list*,vl-list->string,%
2046     vl-list-exported-functions,vl-list-length,vl-list-loaded-vlx,%
2047     vl-load-all,vl-load-com,vl-load-reactors,vl-member-if,%
2048     vl-member-if-not,vl-position,vl-prin1-to-string,%
2049     vl-princ-to-string,vl-propagate,vl-registry-delete,%
2050     vl-registry-descendents,vl-registry-read,vl-registry-write,%
2051     vl-remove,vl-remove-if,vl-remove-if-not,vl-some,vl-sort,%
2052     vl-sort-i,vl-string->list,vl-string-elt,vl-string-left-trim,%
2053     vl-string-mismatch,vl-string-position,vl-string-right-trim,%
2054     vl-string-search,vl-string-subst,vl-string-translate,%
2055     vl-string-trim,vl-symbol-name,vl-symbol-value,vl-symbolp,%
2056     vl-unload-vlx,vl-vbaload,vl-vbarun,vl-vlx-loaded-p,vlax-3D-point,%
2057     vlax-add-cmd,vlax-create-object,vlax-curve-getArea,%
2058     vlax-curve-getDistAtParam,vlax-curve-getDistAtPoint,%
2059     vlax-curve-getEndParam,vlax-curve-getEndPoint,%
2060     vlax-curve-getParamAtDist,vlax-curve-getParamAtPoint,%
2061     vlax-curve-getPointAtDist,vlax-curve-getPointAtParam,%
2062     vlax-curve-getStartParam,vlax-curve-getStartPoint,%
2063     vlax-curve-isClosed,vlax-curve-isPeriodic,vlax-curve-isPlanar,%
2064     vlax-curve-getClosestPointTo,%
2065     vlax-curve-getClosestPointToProjection,vlax-curve-getFirstDeriv,%
2066     vlax-curve-getSecondDeriv,vlax-dump-object,%
2067     vlax-ename->vla-object,vlax-erased-p,vlax-for,%
```

```
2068          vlax-get-acad-object,vlax-get-object,vlax-get-or-create-object,%
2069          vlax-get-property,vlax-import-type-library,vlax-invoke-method,%
2070          vlax-ldata-delete,vlax-ldata-get,vlax-ldata-list,vlax-ldata-put,%
2071          vlax-ldata-test,vlax-make-safearray,vlax-make-variant,%
2072          vlax-map-collection,vlax-method-applicable-p,%
2073          vlax-object-released-p,vlax-product-key,%
2074          vlax-property-available-p,vlax-put-property,vlax-read-enabled-p,%
2075          vlax-release-object,vlax-remove-cmd,vlax-safearray-fill,%
2076          vlax-safearray-get-dim,vlax-safearray-get-element,%
2077          vlax-safearray-get-l-bound,vlax-safearray-get-u-bound,%
2078          vlax-safearray-put-element,vlax-safearray-type,%
2079          vlax-safearray->list,vlax-tmatrix,vlax-typeinfo-available-p,%
2080          vlax-variant-change-type,vlax-variant-type,vlax-variant-value,%
2081          vlax-vla-object->ename,vlax-write-enabled-p,vlisp-compile,%
2082          vlr-acdb-reactor,vlr-add,vlr-added-p,vlr-beep-reaction,%
2083          vlr-command-reactor,vlr-current-reaction-name,vlr-data,%
2084          vlr-data-set,vlr-deepclone-reactor,vlr-docmanager-reactor,%
2085          vlr-dwg-reactor,vlr-dxf-reactor,vlr-editor-reactor,%
2086          vlr-insert-reactor,vlr-linker-reactor,vlr-lisp-reactor,%
2087          vlr-miscellaneous-reactor,vlr-mouse-reactor,vlr-notification,%
2088          vlr-object-reactor,vlr-owner-add,vlr-owner-remove,vlr-owners,%
2089          vlr-pers,vlr-pers-list,vlr-pers-p,vlr-pers-release,%
2090          vlr-reaction-names,vlr-reaction-set,vlr-reactions,vlr-reactors,%
2091          vlr-remove,vlr-remove-all,vlr-set-notification,%
2092          vlr-sysvar-reactor,vlr-toolbar-reactor,vlr-trace-reaction,%
2093          vlr-type,vlr-types,vlr-undo-reactor,vlr-wblock-reactor,%
2094          vlr-window-reactor,vlr-xref-reactor,vports,wcmatch,while,%
2095          write-char,write-line,xdroom,xdsize,zerop},%
2096    alsodigit=->,%
2097    otherkeywords={1+,1-},%
2098    sensitive=false,%
2099    morecomment=[l];,%
2100    morecomment=[l];;,%
2101    morestring=[b]"%
2102   }[keywords,comments,strings]%

2103 ⟨/lang2⟩

2104 ⟨*lang2⟩
```

A first approch to elisp by one of the maintainers (Jobst Hoffmann), it is far away from completeness, the list of keywords is defined according the to the needs of the maintainer...

```
2105 \lst@definelanguage{elisp}[][{Lisp}{%
2106    morekeywords={begin, car, cdr, cons, define, display, drop, filter,%
2107      hash-ref, hash-set, if, load-file, lambda, length, map, message,%
2108      progn, quote, require, setq, string-append, take, vector,%
2109    },%
2110    sensitive,%
2111    alsodigit=->,%
2112    otherkeywords={1+,1-},%
2113    sensitive=true,%
2114    morecomment=[l];,%
2115    morecomment=[l];;,%
2116    morestring=[b]"%
2117 }[keywords,comments,strings]%
```

49

2118 ⟨/lang2⟩

2.38 LLVM

LLVM provides a collection of modular and reusable compiler and toolchain technologies, all further information can be found at its home page http://llvm.org/. Scott Pakin provided a language definition for the LLVM intermediate presentation according to http://llvm.org/docs/.[2] The language provides

2119 ⟨∗lang3⟩

2120 \lst@definelanguage{LLVM}{%
2121   morekeywords={%

- Instructions

```
2122         ret,br,switch,indirectbr,invoke,resume,unreachable,%
2123         add,fadd,sub,fsub,mul,fmul,udiv,sdiv,fdiv,urem,srem,frem,%
2124         shl,lshr,ashr,and,or,xor,%
2125         extractelement,insertelement,shufflevector,%
2126         extractvalue,insertvalue,%
2127         alloca,load,store,fence,cmpxchg,atomicrmw,getelementptr,%
2128         trunc,zext,sext,fptrunc,fpext,fptoui,fptosi,uitofp,sitofp,ptrtoint,%
2129         inttoptr,bitcast,to,%
2130         icmp,fcmp,phi,select,call,va_arg,landingpad,%
```

- Atomic operations – some duplication with the above

```
2131         xchg,add,sub,and,nand,or,xor,max,min,umax,umin,%
```

- Comparisons

```
2132         eq,ne,ugt,uge,ult,ule,sgt,sge,slt,sle,%
2133         false,oeq,ogt,oge,olt,ole,one,ord,ueq,ugt,uge,ult,ule,une,uno,true,%
```

- Linkage types

```
2134         private,linker_private,linker_private_weak,linker_private_weak_def_auto,%
2135         internal,available_externally,linkonce,common,weak,appending,extern_weak,%
2136         linkonce_odr,weak_odr,external,dllimport,dllexport,%
```

- Function headers

```
2137         define,declare,%
```

- Parameter attributes

```
2138         zeroext,signext,inreg,byval,sret,noalias,nocapture,next,%
```

- Garbage collector names

```
2139         gc,%
```

- Function attributes

```
2140         address_safety,alignstack,alwaysinline,nonlazybind,inlinehint,naked,%
2141         noimplicitfloat,noinline,noredzone,noreturn,nounwind,optsize,readnone,%
2142         readonly,returns_twice,ssp,sspreq,uwtable,%
```

---

[2]In this section 'I' is Scott Pakin.

50

- Module-level inline assembly

```
2143        module,asm,%
```

- Data layout

```
2144        target,datalayout,%
```

- Inline assembler expressions

```
2145        sideeffect,alignstack,%
```

- Other keywords – I'm probably missing some here.

```
2146        nuw,nsw,exact,inbounds,unnamed_addr},%
2147      morekeywords=[2]{%
```

- Types

```
2148        i1,i2,i4,i8,i16,i32,i64,i128,i256,i512,i1024,% <-- Most common integers
2149        half,float,double,x86_fp80,fp128,ppc_fp128,x86mmx,%
2150        void,label,metadata},%
2151      alsoletter=.,%
2152      sensitive=false,%
2153      morecomment=[l];,%
2154      morestring=[b]"%
2155    }
```

```
2156 ⟨/lang3⟩
```

2.39   Logo

I don't know where the keywords are from and what kind of Logo it is. Help me!

```
2157 ⟨∗lang3⟩
```

```
2158 \lst@definelanguage{Logo}%
2159 % ??? {end,unix} also keywords
2160   {morekeywords={and,atan,arctan,both,break,bf,bl,butfirst,butlast,%
2161      cbreak, close,co,continue,cos,count,clearscreen,cs,debquit,%
2162      describe,diff,difference,ed,edit,either,emptyp,equalp,er,erase,%
2163      errpause,errquit,fifp,filefprint,fifty,fileftype,fip,fileprint,%
2164      fird,fileread,fity,filetype,fiwd,fileword,f,first,or,fp,fprint,%
2165      fput,fty,ftype,full,fullscreen,go,bye,goodbye,gprop,greaterp,%
2166      help,if,iff,iffalse,ift,iftrue,nth,item,keyp,llast,lessp,list,%
2167      local,lput,make,max,maximum,memberp,memtrace,min,minimum,namep,%
2168      not,numberp,oflush,openr,openread,openw,openwrite,op,output,%
2169      pause,plist,pots,pow,pprop,pps,pr,print,product,quotient,random,%
2170      rc,readchar,rl,readlist,remprop,repcount,repeat,request,rnd,run,%
2171      se,sentence,sentencep,setc,setcolor,setipause,setqpause,po,show,%
2172      sin,split,splitscreen,sqrt,stop,sum,test,text,textscreen,thing,%
2173      to,tone,top,toplevel,type,untrace,wait,word,wordp,yaccdebug,is,%
2174      mod,remainder,trace,zerop,back,bk,bto,btouch,fd,forward,fto,%
2175      ftouch,getpen,heading,hit,hitoot,ht,hideturtle,loff,lampoff,lon,%
2176      lampon,lt,left,lot,lotoot,lto,ltouch,penc,pencolor,pd,pendown,pe,%
2177      penerase,penmode,pu,penup,px,penreverse,rt,right,rto,rtouch,%
2178      scrunch,seth,setheading,setscrun,setscrunch,setxy,shownp,st,%
2179      showturtle,towardsxy,clean,wipeclean,xcor,ycor,tur,turtle,%
```

```
2180        display,dpy},%
2181      sensitive=f% ???
2182    }[keywords]%
```

2183 ⟨/lang3⟩

2.40 Lua

Stephan Hennig contributed the Lua keywords.

2184 ⟨*lang2⟩

We begin with the keywords for Lua 5.0:

```
2185 %%
2186 %% Lua definitions (c) 2013 Stephan Hennig
2187 %%
2188 \lst@definelanguage[5.0]{Lua}{%
```

To enable highlighting of library keywords, the dot needs to be a letter.

```
2189    alsoletter={.},%
```

The language definition knows

- language keywords

```
2190        morekeywords=[1]{%
2191          and, break, do, else, elseif, end, false, for, function, if, in,%
2192          local, nil, not, or, repeat, return, then, true, until, while,%
2193        },%
```

- the standard library identifiers

```
2194        morekeywords=[2]{%
```

   – coming from the base library

```
2195            _G, _LOADED, _REQUIREDNAME, _VERSION, LUA_PATH,%
2196            assert, collectgarbage, dofile, error, gcinfo, getfenv,%
2197            getmetatable, ipairs, loadfile, loadlib, loadstring, newproxy,%
2198            next, pairs, pcall, print, rawequal, rawget, rawset, require,%
2199            setfenv, setmetatable, tonumber, tostring, type, unpack, xpcall,%
```

   – coming from the coroutine library

```
2200            coroutine, coroutine.create, coroutine.resume,%
2201            coroutine.status, coroutine.wrap, coroutine.yield,%
```

   – the debug library

```
2202            _TRACEBACK, debug, debug.debug, debug.gethook, debug.getinfo,%
2203            debug.getlocal, debug.getupvalue, debug.sethook, debug.setlocal,%
2204            debug.setupvalue,debug.traceback,%
```

   – the io library

```
2205            io, io.close, io.flush, io.input, io.lines, io.open, io.output,%
2206            io.popen, io.read, io.stderr, io.stdin, io.stdout, io.tmpfile,%
2207            io.type, io.write,%
```

- the mathematical library

```
2208        __pow, math, math.abs, math.acos, math.asin, math.atan, math.atan2,%
2209        math.ceil, math.cos, math.deg, math.exp, math.floor, math.frexp,%
2210        math.ldexp, math.log, math.log10, math.max, math.min, math.mod,%
2211        math.pi, math.pow, math.rad, math.random, math.randomseed, math.sin,%
2212        math.sqrt, math.tan,%
```

- the os library

```
2213        os, os.clock, os.date, os.difftime, os.execute, os.exit, os.getenv,%
2214        os.remove, os.rename, os.setlocale, os.time, os.tmpname,%
```

- the string library

```
2215        string, string.byte, string.char, string.dump, string.find,%
2216        string.format, string.gfind, string.gsub, string.len, string.lower,%
2217        string.rep, string.sub, string.upper,%
```

- the table library

```
2218        table, table.concat, table.foreach, table.foreachi, table.getn,%
2219        table.insert, table.remove, table.setn, table.sort,%
2220      },%
```

and some additional identifiers

```
2221  morekeywords=[2]{%
2222    _PROMPT, _PROMPT2, arg,%
2223  },%
```

These are the common language settings

```
2224  sensitive=true,%
2225  % single line comments
2226  morecomment=[l]{--},%
2227  % multi line comments
2228  morecomment=[s]{--[[}{]]},%
2229  % backslash escaped strings
2230  morestring=[b]",%
2231  morestring=[b]',%
2232  % multi line strings
2233  morestring=[s]{[[}{]]},%
2234 }[keywords,comments,strings]%
```

And here are the new definitions for Lua 5.1:

```
2235 \lst@definelanguage[5.1]{Lua}[5.0]{Lua}{%
```

There are some deletions

```
2236  deletekeywords=[2]{%
```

concerning

- the base library

```
2237        _LOADED, _REQUIREDNAME, LUA_PATH, gcinfo, loadlib,%
```

- the debug library

```
2238        _TRACEBACK,%
```

- the mathematical library

```
2239        __pow, math.mod,%
```

53

- the string library

```
2240          string.gfind,%
```

- the table library

```
2241          table.foreach, table.foreachi, table.getn, table.setn,%
2242        },%
```

and some new identifiers in standard libraries like

```
2243    morekeywords=[2]{%
```

- the base library

```
2244          load, select,%
```

- coroutine library

```
2245          coroutine.running,%
```

- debug library

```
2246          debug.getfenv, debug.getmetatable, debug.getregistry, debug.setfenv,%
2247          debug.setmetatable,%
```

- the mathematical library

```
2248          math.cosh, math.fmod, math.huge, math.modf, math.sinh, math.tanh,%
```

- the package library which itself is new in Lua 5.1

```
2249          module, package, package.config, package.cpath, package.loaded,%
2250          package.loaders, package.loadlib, package.path, package.preload,%
2251          package.seeall,%
```

- the string library and

```
2252          string.gmatch, string.match, string.reverse,%
```

- the table library

```
2253          table.maxn,%
2254        },%
```

In Lua 5.1 long bracket comments were introduced also

```
2255    morecomment=[s]{--[=[}{]=]},%
2256    morecomment=[s]{--[==[}{]==]},%
2257    morecomment=[s]{--[===[}{]===]},%
2258    morecomment=[s]{--[====[}{]====]},%
2259    morecomment=[s]{--[=====[}{]=====]},%
2260    morecomment=[s]{--[======[}{]======]},%
2261    morecomment=[s]{--[=======[}{]=======]},%
2262    morecomment=[s]{--[========[}{]========]},%
2263    morecomment=[s]{--[=========[}{]=========]},%
2264    morecomment=[s]{--[==========[}{]==========]},%
```

as well as long bracket strings

```
2265    morestring=[s]{[=[}{]=]},%
2266    morestring=[s]{[==[}{]==]},%
2267    morestring=[s]{[===[}{]===]},%
2268    morestring=[s]{[====[}{]====]},%
2269    morestring=[s]{[=====[}{]=====]},%
2270    morestring=[s]{[======[}{]======]},%
2271    morestring=[s]{[=======[}{]=======]},%
2272    morestring=[s]{[========[}{]========]},%
2273    morestring=[s]{[=========[}{]=========]},%
2274    morestring=[s]{[==========[}{]==========]},%
2275 }[keywords,comments,strings]%
```

Lua 5.2 again has some changed features. These are

```
2276 \lst@definelanguage[5.2]{Lua}[5.1]{Lua}{%
```

- new language keywords

```
2277        morekeywords=[1]{%
2278          goto,%
2279        },%
```

- deleted identifiers from the standard libraries like

```
2280        deletekeywords=[2]{%
```

   − the base library

```
2281            getfenv, loadstring, module, newproxy, setfenv, unpack,%
```

   − the debug library

```
2282            debug.getfenv, debug.setfenv,%
```

   − the mathematical library

```
2283            math.log10,%
```

   − the package library and

```
2284            package.loaders, package.seeall,%
```

   − the table library

```
2285            table.maxn,%
2286          },%
```

Again there are some new identifiers in the standard libraries

```
2287    morekeywords=[2]{%
```

like

- the base library

```
2288        rawlen,%
```

- the bit library

```
2289        bit32, bit32.arshift, bit32.band, bit32.bnot, bit32.bor,%
2290        bit32.btest, bit32.bxor, bit32.extract, bit32.lrotate,%
2291        bit32.lshift, bit32.replace, bit32.rrotate, bit32.rshift,%
```

- the debug library

```
2292         debug.getuservalue, debug.setuservalue, debug.upvalueid,%
2293         debug.upvaluejoin,%
```

- the package library

```
2294         package.searchers, package.searchpath,%
```

- the table library

```
2295         table.pack, table.unpack,%
2296      },%
```

There is a new additional identifier

```
2297  morekeywords=[2]{%
2298    _ENV,%
2299  },%
```

and labels are also new in Lua 5.2

```
2300  moredelim=[s][keywordstyle3]{::}{::},%
2301 }[keywords,comments,strings]%
```

In January 2015 Lua 5.3 was released, Stephan Hennig again contributed the Lua keywords.

```
2302 \lst@definelanguage[5.3]{Lua}[5.2]{Lua}{%
```

- some libraries are deprecated, so the following identifiers are deleted

```
2303      deletekeywords=[2]{%
```

  – the `bit32` library

```
2304             bit32, bit32.arshift, bit32.band, bit32.bnot, bit32.bor,%
2305             bit32.btest, bit32.bxor, bit32.extract, bit32.lrotate,%
2306             bit32.lshift, bit32.replace, bit32.rrotate, bit32.rshift,%
```

  – the mathematical library

```
2307             math.atan2, math.cosh, math.frexp, math.ldexp, math.pow,%
2308             math.sinh, math.tanh,%
2309           },%
```

Again there are some new identifiers in the standard libraries

```
2310  morekeywords=[2]{%
```

like

- the coroutine library

```
2311         coroutine.isyieldable,%
```

- the mathematical library

```
2312         math.maxinteger, math.mininteger, math.tointeger, math.type,%
2313         math.ult,%
```

- the string library

```
2314         string.pack, string.packsize, string.unpack,%
```

- the table library

```
2315        table.move,%
```

- the utf-8 library

```
2316        utf8, utf8.char, utf8.charpattern, utf8.codepoint, utf8.codes,%
2317        utf8.len, utf8.offset,%
2318      },%
2319    }[keywords,comments,strings]%
```

```
2320      ⟨/lang2⟩
```

Stephan Hennig also supplied a definition of a style for printing Lua code:

```
2321 ⟨*lua-prf⟩
```

```
2322 \usepackage[rgb, x11names]{xcolor}
2323 \lstdefinestyle{Lua}{%
2324   language=[5.2]Lua,
2325   basicstyle=\ttfamily,
2326   columns=spaceflexible,
2327   keywordstyle=\bfseries\color{Blue4},% language keywords
2328   keywordstyle=[2]\bfseries\color{RoyalBlue3},% std. library identifiers
2329   keywordstyle=[3]\bfseries\color{Purple3},% labels
2330   stringstyle=\bfseries\color{Coral4},% strings
2331   commentstyle=\itshape\color{Green4},% comments
2332 }
```

This code is provided in the file `listings-lua.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
2333 ⟨/lua-prf⟩
```

2.41 Make

Rolf Niepraschk sent me the new definitions. Markus Pahlow found a missing comma and added some keywords, which improve the highlighting with `makemacrouse=true` (but I haven't tested this).

```
2334 ⟨*lang2⟩
```

```
2335 %%
2336 %% Make definitions (c) 2000 Rolf Niepraschk
2337 %%
2338 \lst@definelanguage[gnu]{make}%
2339   {morekeywords={SHELL,MAKE,MAKEFLAGS,$@,$\%,$<,$?,$^,$+,$*,%
2340      @,^,<,\%,+,?,*,% Markus Pahlow
2341      export,unexport,include,override,define,ifdef,ifneq,ifeq,else,%
2342      endif,vpath,subst,patsubst,strip,findstring,filter,filter-out,%
2343      sort,dir,notdir,suffix,basename,addsuffix,addprefix,join,word,%
2344      words,firstword,wildcard,shell,origin,foreach,%
2345      @D,@F,*D,*F,\%D,\%F,<D,<F,^D,^F,+D,+F,?D,?F,%
2346      AR,AS,CC,CXX,CO,CPP,FC,GET,LEX,PC,YACC,YACCR,MAKEINFO,TEXI2DVI,%
2347      WEAVE,CWEAVE,TANGLE,CTANGLE,RM,M2C,LINT,COMPILE,LINK,PREPROCESS,%
2348      CHECKOUT,%
2349      ARFLAGS,ASFLAGS,CFLAGS,CXXFLAGS,COFLAGS,CPPFLAGS,FFLAGS,GFLAGS,%
2350      LDFLAGS,LOADLIBES,LFLAGS,PFLAGS,RFLAGS,YFLAGS,M2FLAGS,MODFLAGS,%
2351      LINTFLAGS,MAKEINFO_FLAGS,TEXI2DVI_FLAGS,COFLAGS,GFLAGS,%
```

```
2352        OUTPUT_OPTION,SCCS_OUTPUT_OPTION,% missing comma: Markus Pahlow
2353        .PHONY,.SUFFIXES,.DEFAULT,.PRECIOUS,.INTERMEDIATE,.SECONDARY,%
2354        .IGNORE,.SILENT,.EXPORT_ALL_VARIABLES,MAKEFILES,VPATH,MAKESHELL,%
2355        MAKELEVEL,MAKECMDGOALS,SUFFIXES},%
2356      sensitive=true,
2357      morecomment=[l]\#,%
2358      morestring=[b]"%
2359    }[keywords,comments,strings,make]%

2360  \lst@definelanguage{make}
2361    {morekeywords={SHELL,MAKE,MAKEFLAGS,$@,$\%,$<,$?,$^,$+,$*},%
2362      sensitive=true,%
2363      morecomment=[l]\#,%
2364      morestring=[b]"%
2365    }[keywords,comments,strings,make]%
```

The two [b]-arguments have been added after a bug report by Dr. Jobst Hoffmann

```
2366  ⟨/lang2⟩
```

2.42   Matlab

I (C. H.?) took the keywords from http://www.utexas.edu/math/Matlab/Manual,
but I removed the keywords i, j and tmp—the change was proposed by Kai Below.

```
2367  ⟨*lang1⟩
```

From the revision history one can conclude that "Matlab´´ means "Matlab 5.1´´
which was released in 1997

```
2368  \lst@definelanguage[5.1]{Matlab}[]{Matlab}{}

2369  \lst@definelanguage{Matlab}%
2370    {morekeywords={gt,lt,gt,lt,amp,abs,acos,acosh,acot,acoth,acsc,acsch,%
2371        all,angle,ans,any,asec,asech,asin,asinh,atan,atan2,atanh,auread,%
2372        auwrite,axes,axis,balance,bar,bessel,besselk,bessely,beta,%
2373        betainc,betaln,blanks,bone,break,brighten,capture,cart2pol,%
2374        cart2sph,caxis,cd,cdf2rdf,cedit,ceil,chol,cla,clabel,clc,clear,%
2375        clf,clock,close,colmmd,Colon,colorbar,colormap,ColorSpec,colperm,%
2376        comet,comet3,compan,compass,computer,cond,condest,conj,contour,%
2377        contour3,contourc,contrast,conv,conv2,cool,copper,corrcoef,cos,%
2378        cosh,cot,coth,cov,cplxpair,cputime,cross,csc,csch,csvread,%
2379        csvwrite,cumprod,cumsum,cylinder,date,dbclear,dbcont,dbdown,%
2380        dbquit,dbstack,dbstatus,dbstep,dbstop,dbtype,dbup,ddeadv,ddeexec,%
2381        ddeinit,ddepoke,ddereq,ddeterm,ddeunadv,deblank,dec2hex,deconv,%
2382        del2,delete,demo,det,diag,diary,diff,diffuse,dir,disp,dlmread,%
2383        dlmwrite,dmperm,dot,drawnow,echo,eig,ellipj,ellipke,else,elseif,%
2384        end,engClose,engEvalString,engGetFull,engGetMatrix,engOpen,%
2385        engOutputBuffer,engPutFull,engPutMatrix,engSetEvalCallback,%
2386        engSetEvalTimeout,engWinInit,eps,erf,erfc,erfcx,erfinv,error,%
2387        errorbar,etime,etree,eval,exist,exp,expint,expm,expo,eye,fclose,%
2388        feather,feof,ferror,feval,fft,fft2,fftshift,fgetl,fgets,figure,%
2389        fill,fill3,filter,filter2,find,findstr,finite,fix,flag,fliplr,%
2390        flipud,floor,flops,fmin,fmins,fopen,for,format,fplot,fprintf,%
2391        fread,frewind,fscanf,fseek,ftell,full,function,funm,fwrite,fzero,%
2392        gallery,gamma,gammainc,gammaln,gca,gcd,gcf,gco,get,getenv,%
2393        getframe,ginput,global,gplot,gradient,gray,graymon,grid,griddata,%
2394        gtext,hadamard,hankel,help,hess,hex2dec,hex2num,hidden,hilb,hist,%
```

```
2395        hold,home,hostid,hot,hsv,hsv2rgb,if,ifft,ifft2,imag,image,%
2396        imagesc,Inf,info,input,int2str,interp1,interp2,interpft,inv,%
2397        invhilb,isempty,isglobal,ishold,isieee,isinf,isletter,isnan,%
2398        isreal,isspace,issparse,isstr,jet,keyboard,kron,lasterr,lcm,%
2399        legend,legendre,length,lin2mu,line,linspace,load,log,log10,log2,%
2400        loglog,logm,logspace,lookfor,lower,ls,lscov,lu,magic,matClose,%
2401        matDeleteMatrix,matGetDir,matGetFp,matGetFull,matGetMatrix,%
2402        matGetNextMatrix,matGetString,matlabrc,matlabroot,matOpen,%
2403        matPutFull,matPutMatrix,matPutString,max,mean,median,menu,mesh,%
2404        meshc,meshgrid,meshz,mexAtExit,mexCallMATLAB,mexdebug,%
2405        mexErrMsgTxt,mexEvalString,mexFunction,mexGetFull,mexGetMatrix,%
2406        mexGetMatrixPtr,mexPrintf,mexPutFull,mexPutMatrix,mexSetTrapFlag,%
2407        min,more,movie,moviein,mu2lin,mxCalloc,mxCopyCharacterToPtr,%
2408        mxCopyComplex16ToPtr,mxCopyInteger4ToPtr,mxCopyPtrToCharacter,%
2409        mxCopyPtrToComplex16,mxCopyPtrToInteger4,mxCopyPtrToReal8,%
2410        mxCopyReal8ToPtr,mxCreateFull,mxCreateSparse,mxCreateString,%
2411        mxFree,mxFreeMatrix,mxGetIr,mxGetJc,mxGetM,mxGetN,mxGetName,%
2412        mxGetNzmax,mxGetPi,mxGetPr,mxGetScalar,mxGetString,mxIsComplex,%
2413        mxIsFull,mxIsNumeric,mxIsSparse,mxIsString,mxIsTypeDouble,%
2414        mxSetIr,mxSetJc,mxSetM,mxSetN,mxSetName,mxSetNzmax,mxSetPi,%
2415        mxSetPr,NaN,nargchk,nargin,nargout,newplot,nextpow2,nnls,nnz,%
2416        nonzeros,norm,normest,null,num2str,nzmax,ode23,ode45,orient,orth,%
2417        pack,pascal,patch,path,pause,pcolor,pi,pink,pinv,plot,plot3,%
2418        pol2cart,polar,poly,polyder,polyeig,polyfit,polyval,polyvalm,%
2419        pow2,print,printopt,prism,prod,pwd,qr,qrdelete,qrinsert,quad,%
2420        quad8,quit,quiver,qz,rand,randn,randperm,rank,rat,rats,rbbox,%
2421        rcond,real,realmax,realmin,refresh,rem,reset,reshape,residue,%
2422        return,rgb2hsv,rgbplot,rootobject,roots,rose,rosser,rot90,rotate,%
2423        round,rref,rrefmovie,rsf2csf,save,saxis,schur,sec,sech,semilogx,%
2424        semilogy,set,setstr,shading,sign,sin,sinh,size,slice,sort,sound,%
2425        spalloc,sparse,spaugment,spconvert,spdiags,specular,speye,spfun,%
2426        sph2cart,sphere,spinmap,spline,spones,spparms,sprandn,sprandsym,%
2427        sprank,sprintf,spy,sqrt,sqrtm,sscanf,stairs,startup,std,stem,%
2428        str2mat,str2num,strcmp,strings,strrep,strtok,subplot,subscribe,%
2429        subspace,sum,surf,surface,surfc,surfl,surfnorm,svd,symbfact,%
2430        symmmd,symrcm,tan,tanh,tempdir,tempname,terminal,text,tic,title,%
2431        toc,toeplitz,trace,trapz,tril,triu,type,uicontrol,uigetfile,%
2432        uimenu,uiputfile,unix,unwrap,upper,vander,ver,version,view,%
2433        viewmtx,waitforbuttonpress,waterfall,wavread,wavwrite,what,%
2434        whatsnew,which,while,white,whitebg,who,whos,wilkinson,wk1read,%
2435        wk1write,xlabel,xor,ylabel,zeros,zlabel,zoom},%
2436      sensitive,%
2437      morecomment=[l]\%,%
2438      morestring=[m]'%
2439    }[keywords,comments,strings]%
2440 ⟨/lang1⟩
```

2.43 Mathematica

Michael Wiese typed in all the keywords for the 1.0 and 3.0 versions. Oliver Ruebenkoenig wrote a script to generate the lists for the 5.2 version. Simon Pearce provided the list of keywords for Mathematica 11.0.

```
2441 ⟨*lang1⟩
```

```
2442 \lst@definelanguage[11.0]{Mathematica}[5.2]{Mathematica}{%
2443   morekeywords={
2444     "AASTriangle", "AbelianGroup", "Abort", "AbortKernels",%
2445     "AbortProtect", "AbortScheduledTask", "Above", "Abs", "AbsArg",%
2446     "Absolute", "AbsoluteCorrelation", "AbsoluteCorrelationFunction",%
2447     "AbsoluteCurrentValue", "AbsoluteDashing", "AbsoluteFileName",%
2448     "AbsoluteOptions", "AbsolutePointSize", "AbsoluteThickness",%
2449     "AbsoluteTime", "AbsoluteTiming", "AccountingForm", "Accumulate",%
2450     "Accuracy", "AccuracyGoal", "ActionDelay", "ActionMenu",%
2451     "ActionMenuBox", "ActionMenuBoxOptions", "Activate", "Active",%
2452     "ActiveItem", "ActiveStyle", "AcyclicGraphQ", "AddOnHelpPath",%
2453     "AddTo", "AddUsers", "AdjacencyGraph", "AdjacencyList",%
2454     "AdjacencyMatrix", "AdjustmentBox", "AdjustmentBoxOptions",%
2455     "AdjustTimeSeriesForecast", "AdministrativeDivisionData",%
2456     "AffineHalfSpace", "AffineSpace", "AffineStateSpaceModel",%
2457     "AffineTransform", "After", "AircraftData", "AirportData",%
2458     "AirPressureData", "AirTemperatureData", "AiryAi", "AiryAiPrime",%
2459     "AiryAiZero", "AiryBi", "AiryBiPrime", "AiryBiZero",%
2460     "AlgebraicIntegerQ", "AlgebraicNumber", "AlgebraicNumberDenominator",%
2461     "AlgebraicNumberNorm", "AlgebraicNumberPolynomial",%
2462     "AlgebraicNumberTrace", "AlgebraicRules", "AlgebraicRulesData",%
2463     "Algebraics", "AlgebraicUnitQ", "Alignment", "AlignmentMarker",%
2464     "AlignmentPoint", "All", "AllowedDimensions", "AllowedHeads",%
2465     "AllowGroupClose", "AllowIncomplete", "AllowInlineCells",%
2466     "AllowKernelInitialization", "AllowLooseGrammar",%
2467     "AllowReverseGroupClose", "AllowScriptLevelChange", "AllTrue",%
2468     "Alphabet", "AlphabeticOrder", "AlphabeticSort", "AlphaChannel",%
2469     "AlternateImage", "AlternatingFactorial", "AlternatingGroup",%
2470     "AlternativeHypothesis", "Alternatives", "AltitudeMethod",%
2471     "AmbientLight", "AmbiguityFunction", "AmbiguityList", "Analytic",%
2472     "AnatomyData", "AnatomyForm", "AnatomyPlot3D", "AnchoredSearch",%
2473     "And", "AndersonDarlingTest", "AngerJ", "AngleBracket", "AnglePath",%
2474     "AngleVector", "AngularGauge", "Animate", "AnimationCycleOffset",%
2475     "AnimationCycleRepetitions", "AnimationDirection",%
2476     "AnimationDisplayTime", "AnimationRate", "AnimationRepetitions",%
2477     "AnimationRunning", "AnimationRunTime", "AnimationTimeIndex",%
2478     "Animator", "AnimatorBox", "AnimatorBoxOptions", "AnimatorElements",%
2479     "Annotation", "Annuity", "AnnuityDue", "Annulus", "Anonymous",%
2480     "Antialiasing", "AntihermitianMatrixQ", "Antisymmetric",%
2481     "AntisymmetricMatrixQ", "AnyOrder", "AnySubset", "AnyTrue", "Apart",%
2482     "ApartSquareFree", "APIFunction", "Appearance", "AppearanceElements",%
2483     "AppearanceRules", "AppellF1", "Append", "AppendTo", "Apply",%
2484     "ArcCos", "ArcCosh", "ArcCot", "ArcCoth", "ArcCsc", "ArcCsch",%
2485     "ArcCurvature", "ARCHProcess", "ArcLength", "ArcSec", "ArcSech",%
2486     "ArcSin", "ArcSinDistribution", "ArcSinh", "ArcTan", "ArcTanh",%
2487     "Area", "Arg", "ArgMax", "ArgMin", "ArgumentCountQ", "ARIMAProcess",%
2488     "ArithmeticGeometricMean", "ARMAProcess", "ARProcess", "Array",%
2489     "ArrayComponents", "ArrayDepth", "ArrayFilter", "ArrayFlatten",%
2490     "ArrayMesh", "ArrayPad", "ArrayPlot", "ArrayQ", "ArrayResample",%
2491     "ArrayReshape", "ArrayRules", "Arrays", "Arrow", "Arrow3DBox",%
2492     "ArrowBox", "Arrowheads", "ASATriangle", "Ask", "AskAppend",%
2493     "AskConfirm", "AskDisplay", "AskedQ", "AskedValue", "AskFunction",%
2494     "AskTemplateDisplay", "AspectRatio", "AspectRatioFixed", "Assert",%
2495     "AssociateTo", "Association", "AssociationFormat", "AssociationMap",%
```

```
2496    "AssociationQ", "AssociationThread", "AssumeDeterministic",%
2497    "Assuming", "Assumptions", "AstronomicalData",%
2498    "AsymptoticOutputTracker", "Asynchronous", "AsynchronousTaskObject",%
2499    "AsynchronousTasks", "AtomQ", "Attributes", "Audio", "AudioAmplify",%
2500    "AudioBlockMap", "AudioChannelCombine", "AudioChannelMix",%
2501    "AudioChannels", "AudioChannelSeparate", "AudioData", "AudioDelay",%
2502    "AudioDelete", "AudioDevice", "AudioFade", "AudioFrequencyShift",%
2503    "AudioGenerator", "AudioIntervals", "AudioJoin", "AudioLabel",%
2504    "AudioLength", "AudioLocalMeasurements", "AudioMeasurements",%
2505    "AudioNormalize", "AudioOverlay", "AudioPad", "AudioPan",%
2506    "AudioPartition", "AudioPitchShift", "AudioPlot", "AudioQ",%
2507    "AudioResample", "AudioReverb", "AudioSampleRate", "AudioSplit",%
2508    "AudioTimeStretch", "AudioTrim", "AudioType",%
2509    "AugmentedSymmetricPolynomial", "Authentication", "AutoAction",%
2510    "Autocomplete", "AutocompletionFunction", "AutoCopy",%
2511    "AutocorrelationTest", "AutoDelete", "AutoEvaluateEvents",%
2512    "AutoGeneratedPackage", "AutoIndent", "AutoIndentSpacings",%
2513    "AutoItalicWords", "AutoloadPath", "AutoMatch", "Automatic",%
2514    "AutomaticImageSize", "AutoMultiplicationSymbol",%
2515    "AutoNumberFormatting", "AutoOpenNotebooks", "AutoOpenPalettes",%
2516    "AutoRefreshed", "AutoRemove", "AutorunSequencing", "AutoScaling",%
2517    "AutoScroll", "AutoSpacing", "AutoStyleOptions", "AutoStyleWords",%
2518    "AutoSubmitting", "Axes", "AxesEdge", "AxesLabel", "AxesOrigin",%
2519    "AxesStyle", "Axis", "BabyMonsterGroupB", "Back", "Background",%
2520    "BackgroundTasksSettings", "Backslash", "Backsubstitution",%
2521    "Backward", "Ball", "Band", "BandpassFilter", "BandstopFilter",%
2522    "BarabasiAlbertGraphDistribution", "BarChart", "BarChart3D",%
2523    "BarcodeImage", "BarcodeRecognize", "BaringhausHenzeTest",%
2524    "BarLegend", "BarlowProschanImportance", "BarnesG", "BarOrigin",%
2525    "BarSpacing", "BartlettHannWindow", "BartlettWindow", "BaseForm",%
2526    "Baseline", "BaselinePosition", "BaseStyle",%
2527    "BatchNormalizationLayer", "BatchSize", "BatesDistribution",%
2528    "BattleLemarieWavelet", "BayesianMaximization",%
2529    "BayesianMaximizationObject", "BayesianMinimization",%
2530    "BayesianMinimizationObject", "Because", "BeckmannDistribution",%
2531    "Beep", "Before", "Begin", "BeginDialogPacket",%
2532    "BeginFrontEndInteractionPacket", "BeginPackage", "BellB", "BellY",%
2533    "Below", "BenfordDistribution", "BeniniDistribution",%
2534    "BenktanderGibratDistribution", "BenktanderWeibullDistribution",%
2535    "BernoulliB", "BernoulliDistribution", "BernoulliGraphDistribution",%
2536    "BernoulliProcess", "BernsteinBasis", "BesselFilterModel", "BesselI",%
2537    "BesselJ", "BesselJZero", "BesselK", "BesselY", "BesselYZero",%
2538    "Beta", "BetaBinomialDistribution", "BetaDistribution",%
2539    "BetaNegativeBinomialDistribution", "BetaPrimeDistribution",%
2540    "BetaRegularized", "Between", "BetweennessCentrality", "BezierCurve",%
2541    "BezierCurve3DBox", "BezierCurve3DBoxOptions", "BezierCurveBox",%
2542    "BezierCurveBoxOptions", "BezierFunction", "BilateralFilter",%
2543    "Binarize", "BinaryDistance", "BinaryFormat", "BinaryImageQ",%
2544    "BinaryRead", "BinaryReadList", "BinaryWrite", "BinCounts",%
2545    "BinLists", "Binomial", "BinomialDistribution", "BinomialProcess",%
2546    "BinormalDistribution", "BiorthogonalSplineWavelet",%
2547    "BipartiteGraphQ", "BiquadraticFilterModel", "BirnbaumImportance",%
2548    "BirnbaumSaundersDistribution", "BitAnd", "BitClear", "BitGet",%
2549    "BitLength", "BitNot", "BitOr", "BitSet", "BitShiftLeft",%
```

```
2550    "BitShiftRight", "BitXor", "Black", "BlackmanHarrisWindow",%
2551    "BlackmanNuttallWindow", "BlackmanWindow", "Blank", "BlankForm",%
2552    "BlankNullSequence", "BlankSequence", "Blend", "Block", "BlockMap",%
2553    "BlockRandom", "BlomqvistBeta", "BlomqvistBetaTest", "Blue", "Blur",%
2554    "BodePlot", "BohmanWindow", "Bold", "Bookmarks", "Boole",%
2555    "BooleanConsecutiveFunction", "BooleanConvert",%
2556    "BooleanCountingFunction", "BooleanFunction", "BooleanGraph",%
2557    "BooleanMaxterms", "BooleanMinimize", "BooleanMinterms", "BooleanQ",%
2558    "BooleanRegion", "Booleans", "BooleanStrings", "BooleanTable",%
2559    "BooleanVariables", "BorderDimensions", "BorelTannerDistribution",%
2560    "Bottom", "BottomHatTransform", "BoundaryDiscretizeGraphics",%
2561    "BoundaryDiscretizeRegion", "BoundaryMesh", "BoundaryMeshRegion",%
2562    "BoundaryMeshRegionQ", "BoundaryStyle", "BoundedRegionQ",%
2563    "BoundingRegion", "Bounds", "Box", "BoxBaselineShift", "BoxData",%
2564    "BoxDimensions", "Boxed", "Boxes", "BoxForm", "BoxFormFormatTypes",%
2565    "BoxFrame", "BoxID", "BoxMargins", "BoxMatrix", "BoxObject",%
2566    "BoxRatios", "BoxRotation", "BoxRotationPoint", "BoxStyle",%
2567    "BoxWhiskerChart", "Bra", "BracketingBar", "BraKet",%
2568    "BrayCurtisDistance", "BreadthFirstScan", "Break", "BridgeData",%
2569    "BroadcastStationData", "Brown", "BrownForsytheTest",%
2570    "BrownianBridgeProcess", "BrowserCategory", "BSplineBasis",%
2571    "BSplineCurve", "BSplineCurve3DBox", "BSplineCurve3DBoxOptions",%
2572    "BSplineCurveBox", "BSplineCurveBoxOptions", "BSplineFunction",%
2573    "BSplineSurface", "BSplineSurface3DBox",%
2574    "BSplineSurface3DBoxOptions", "BubbleChart", "BubbleChart3D",%
2575    "BubbleScale", "BubbleSizes", "BuildingData", "BulletGauge",%
2576    "BusinessDayQ", "ButterflyGraph", "ButterworthFilterModel", "Button",%
2577    "ButtonBar", "ButtonBox", "ButtonBoxOptions", "ButtonCell",%
2578    "ButtonContents", "ButtonData", "ButtonEvaluator",%
2579    "ButtonExpandable", "ButtonFrame", "ButtonFunction", "ButtonMargins",%
2580    "ButtonMinHeight", "ButtonNote", "ButtonNotebook", "ButtonSource",%
2581    "ButtonStyle", "ButtonStyleMenuListing", "Byte", "ByteArray",%
2582    "ByteArrayQ", "ByteCount", "ByteOrdering", "C", "CachedValue",%
2583    "CacheGraphics", "CachePersistence", "CalendarConvert",%
2584    "CalendarData", "CalendarType", "Callout", "CalloutMarker",%
2585    "CalloutStyle", "CallPacket", "CanberraDistance", "Cancel",%
2586    "CancelButton", "CandlestickChart", "CanonicalGraph",%
2587    "CanonicalName", "CanonicalWarpingCorrespondence",%
2588    "CanonicalWarpingDistance", "CantorStaircase", "Cap", "CapForm",%
2589    "CapitalDifferentialD", "Capitalize", "CapsuleShape",%
2590    "CardinalBSplineBasis", "CarlemanLinearize", "CarmichaelLambda",%
2591    "CaseOrdering", "Cases", "CaseSensitive", "Cashflow", "Casoratian",%
2592    "Catalan", "CatalanNumber", "Catch", "Catenate", "CatenateLayer",%
2593    "CauchyDistribution", "CauchyWindow", "CayleyGraph", "CDF",%
2594    "CDFDeploy", "CDFInformation", "CDFWavelet", "Ceiling",%
2595    "CelestialSystem", "Cell", "CellAutoOverwrite", "CellBaseline",%
2596    "CellBoundingBox", "CellBracketOptions", "CellChangeTimes",%
2597    "CellContents", "CellContext", "CellDingbat",%
2598    "CellDynamicExpression", "CellEditDuplicate",%
2599    "CellElementsBoundingBox", "CellElementSpacings", "CellEpilog",%
2600    "CellEvaluationDuplicate", "CellEvaluationFunction",%
2601    "CellEventActions", "CellFrame", "CellFrameColor",%
2602    "CellFrameLabelMargins", "CellFrameLabels", "CellFrameMargins",%
2603    "CellGroup", "CellGroupData", "CellGrouping", "CellGroupingRules",%
```

```
2604    "CellHorizontalScrolling", "CellID", "CellLabel",%
2605    "CellLabelAutoDelete", "CellLabelMargins", "CellLabelPositioning",%
2606    "CellMargins", "CellObject", "CellOpen", "CellPrint", "CellProlog",%
2607    "Cells", "CellSize", "CellStyle", "CellTags", "CellularAutomaton",%
2608    "CensoredDistribution", "Censoring", "Center", "CenterArray",%
2609    "CenterDot", "CentralMoment", "CentralMomentGeneratingFunction",%
2610    "CForm", "ChampernowneNumber", "ChangeOptions", "ChannelBase",%
2611    "ChannelDatabin", "ChannelHistoryLength", "ChannelListen",%
2612    "ChannelListener", "ChannelListeners", "ChannelListenerWait",%
2613    "ChannelObject", "ChannelPreSendFunction", "ChannelSend",%
2614    "ChannelSubscribers", "ChanVeseBinarize", "Character",%
2615    "CharacterCounts", "CharacterEncoding", "CharacterEncodingsPath",%
2616    "CharacteristicFunction", "CharacteristicPolynomial",%
2617    "CharacterName", "CharacterRange", "Characters", "ChartBaseStyle",%
2618    "ChartElementData", "ChartElementDataFunction",%
2619    "ChartElementFunction", "ChartElements", "ChartLabels",%
2620    "ChartLayout", "ChartLegends", "ChartStyle", "Chebyshev1FilterModel",%
2621    "Chebyshev2FilterModel", "ChebyshevDistance", "ChebyshevT",%
2622    "ChebyshevU", "Check", "CheckAbort", "CheckAll", "Checkbox",%
2623    "CheckboxBar", "CheckboxBox", "CheckboxBoxOptions", "ChemicalData",%
2624    "ChessboardDistance", "ChiDistribution", "ChineseRemainder",%
2625    "ChiSquareDistribution", "ChoiceButtons", "ChoiceDialog",%
2626    "CholeskyDecomposition", "Chop", "ChromaticityPlot",%
2627    "ChromaticityPlot3D", "ChromaticPolynomial", "Circle", "CircleBox",%
2628    "CircleDot", "CircleMinus", "CirclePlus", "CirclePoints",%
2629    "CircleTimes", "CirculantGraph",%
2630    "CircularOrthogonalMatrixDistribution",%
2631    "CircularQuaternionMatrixDistribution",%
2632    "CircularRealMatrixDistribution",%
2633    "CircularSymplecticMatrixDistribution",%
2634    "CircularUnitaryMatrixDistribution", "Circumsphere", "CityData",%
2635    "ClassifierFunction", "ClassifierInformation",%
2636    "ClassifierMeasurements", "ClassifierMeasurementsObject", "Classify",%
2637    "ClassPriors", "Clear", "ClearAll", "ClearAttributes",%
2638    "ClearCookies", "ClearPermissions", "ClearSystemCache",%
2639    "ClebschGordan", "ClickPane", "Clip", "ClipboardNotebook",%
2640    "ClipFill", "ClippingStyle", "ClipPlanes", "ClipPlanesStyle",%
2641    "ClipRange", "Clock", "ClockGauge", "ClockwiseContourIntegral",%
2642    "Close", "Closed", "CloseKernels", "ClosenessCentrality", "Closing",%
2643    "ClosingAutoSave", "ClosingEvent", "CloudAccountData", "CloudBase",%
2644    "CloudConnect", "CloudDeploy", "CloudDirectory", "CloudDisconnect",%
2645    "CloudEvaluate", "CloudExport", "CloudExpression",%
2646    "CloudExpressions", "CloudFunction", "CloudGet", "CloudImport",%
2647    "CloudLoggingData", "CloudObject", "CloudObjectInformation",%
2648    "CloudObjectInformationData", "CloudObjects", "CloudPublish",%
2649    "CloudPut", "CloudSave", "CloudShare", "CloudSubmit", "CloudSymbol",%
2650    "ClusterClassify", "ClusterDissimilarityFunction",%
2651    "ClusteringComponents", "ClusteringTree", "CMYKColor", "Coarse",%
2652    "CodeAssistOptions", "Coefficient", "CoefficientArrays",%
2653    "CoefficientDomain", "CoefficientList", "CoefficientRules",%
2654    "CoifletWavelet", "Collect", "Colon", "ColonForm", "ColorBalance",%
2655    "ColorCombine", "ColorConvert", "ColorCoverage", "ColorData",%
2656    "ColorDataFunction", "ColorDistance", "ColorFunction",%
2657    "ColorFunctionScaling", "Colorize", "ColorNegate", "ColorOutput",%
```

```
2658    "ColorProfileData", "ColorQ", "ColorQuantize", "ColorReplace",%
2659    "ColorRules", "ColorSelectorSettings", "ColorSeparate",%
2660    "ColorSetter", "ColorSetterBox", "ColorSetterBoxOptions",%
2661    "ColorSlider", "ColorSpace", "ColorToneMapping", "Column",%
2662    "ColumnAlignments", "ColumnBackgrounds", "ColumnForm", "ColumnLines",%
2663    "ColumnsEqual", "ColumnSpacings", "ColumnWidths", "CombinerFunction",%
2664    "CometData", "CommonDefaultFormatTypes", "Commonest",%
2665    "CommonestFilter", "CommonName", "CommonUnits",%
2666    "CommunityBoundaryStyle", "CommunityGraphPlot", "CommunityLabels",%
2667    "CommunityRegionStyle", "CompanyData", "CompatibleUnitQ",%
2668    "CompilationOptions", "CompilationTarget", "Compile", "Compiled",%
2669    "CompiledFunction", "Complement", "CompleteGraph", "CompleteGraphQ",%
2670    "CompleteKaryTree", "CompletionsListPacket", "Complex", "Complexes",%
2671    "ComplexExpand", "ComplexInfinity", "ComplexityFunction",%
2672    "ComponentMeasurements", "ComponentwiseContextMenu", "Compose",%
2673    "ComposeList", "ComposeSeries", "CompositeQ", "Composition",%
2674    "CompoundElement", "CompoundExpression",%
2675    "CompoundPoissonDistribution", "CompoundPoissonProcess",%
2676    "CompoundRenewalProcess", "Compress", "CompressedData", "Condition",%
2677    "ConditionalExpression", "Conditioned", "Cone", "ConeBox",%
2678    "ConfidenceLevel", "ConfidenceRange", "ConfidenceTransform",%
2679    "ConfigurationPath", "ConformationRules", "ConformAudio",%
2680    "ConformImages", "Congruent", "ConicHullRegion",%
2681    "ConicHullRegion3DBox", "ConicHullRegionBox", "Conjugate",%
2682    "ConjugateTranspose", "Conjunction", "Connect",%
2683    "ConnectedComponents", "ConnectedGraphComponents", "ConnectedGraphQ",%
2684    "ConnectedMeshComponents", "ConnectLibraryCallbackFunction",%
2685    "ConnesWindow", "ConoverTest", "ConsoleMessage",%
2686    "ConsoleMessagePacket", "ConsolePrint", "Constant", "ConstantArray",%
2687    "ConstantImage", "ConstantRegionQ", "Constants", "ConstellationData",%
2688    "ConstrainedMax", "ConstrainedMin", "Containing", "ContainsAll",%
2689    "ContainsAny", "ContainsExactly", "ContainsNone", "ContainsOnly",%
2690    "ContentFieldOptions", "ContentLocationFunction", "ContentObject",%
2691    "ContentPadding", "ContentsBoundingBox", "ContentSelectable",%
2692    "ContentSize", "Context", "ContextMenu", "Contexts",%
2693    "ContextToFileName", "Continuation", "Continue", "ContinuedFraction",%
2694    "ContinuedFractionK", "ContinuousAction", "ContinuousMarkovProcess",%
2695    "ContinuousTask", "ContinuousTimeModelQ", "ContinuousWaveletData",%
2696    "ContinuousWaveletTransform", "ContourDetect", "ContourGraphics",%
2697    "ContourIntegral", "ContourLabels", "ContourLines", "ContourPlot",%
2698    "ContourPlot3D", "Contours", "ContourShading", "ContourSmoothing",%
2699    "ContourStyle", "ContraharmonicMean", "Control", "ControlActive",%
2700    "ControlAlignment", "ControllabilityGramian",%
2701    "ControllabilityMatrix", "ControllableDecomposition",%
2702    "ControllableModelQ", "ControllerDuration", "ControllerInformation",%
2703    "ControllerInformationData", "ControllerLinking",%
2704    "ControllerManipulate", "ControllerMethod", "ControllerPath",%
2705    "ControllerState", "ControlPlacement", "ControlsRendering",%
2706    "ControlType", "Convergents", "ConversionOptions", "ConversionRules",%
2707    "ConvertToBitmapPacket", "ConvertToPostScript",%
2708    "ConvertToPostScriptPacket", "ConvexHullMesh", "ConvolutionLayer",%
2709    "Convolve", "ConwayGroupCo1", "ConwayGroupCo2", "ConwayGroupCo3",%
2710    "CookieFunction", "Cookies", "CoordinateBoundingBox",%
2711    "CoordinateBoundingBoxArray", "CoordinateBounds",%
```

```
2712    "CoordinateBoundsArray", "CoordinateChartData",%
2713    "CoordinatesToolOptions", "CoordinateTransform",%
2714    "CoordinateTransformData", "CoprimeQ", "Coproduct",%
2715    "CopulaDistribution", "Copyable", "CopyDatabin", "CopyDirectory",%
2716    "CopyFile", "CopyTag", "CopyToClipboard", "CornerFilter",%
2717    "CornerNeighbors", "Correlation", "CorrelationDistance",%
2718    "CorrelationFunction", "CorrelationTest", "Cos", "Cosh",%
2719    "CoshIntegral", "CosineDistance", "CosineWindow", "CosIntegral",%
2720    "Cot", "Coth", "Count", "CountDistinct", "CountDistinctBy",%
2721    "CounterAssignments", "CounterBox", "CounterBoxOptions",%
2722    "CounterClockwiseContourIntegral", "CounterEvaluator",%
2723    "CounterFunction", "CounterIncrements", "CounterStyle",%
2724    "CounterStyleMenuListing", "CountRoots", "CountryData", "Counts",%
2725    "CountsBy", "Covariance", "CovarianceEstimatorFunction",%
2726    "CovarianceFunction", "CoxianDistribution",%
2727    "CoxIngersollRossProcess", "CoxModel", "CoxModelFit",%
2728    "CramerVonMisesTest", "CreateArchive", "CreateCellID",%
2729    "CreateChannel", "CreateCloudExpression", "CreateDatabin",%
2730    "CreateDialog", "CreateDirectory", "CreateDocument", "CreateFile",%
2731    "CreateIntermediateDirectories", "CreateManagedLibraryExpression",%
2732    "CreateNotebook", "CreatePalette", "CreatePalettePacket",%
2733    "CreatePermissionsGroup", "CreateScheduledTask", "CreateSearchIndex",%
2734    "CreateTemporary", "CreateUUID", "CreateWindow", "CriterionFunction",%
2735    "CriticalityFailureImportance", "CriticalitySuccessImportance",%
2736    "CriticalSection", "Cross", "CrossEntropyLossLayer",%
2737    "CrossingDetect", "CrossMatrix", "Csc", "Csch", "CubeRoot", "Cubics",%
2738    "Cuboid", "CuboidBox", "Cumulant", "CumulantGeneratingFunction",%
2739    "Cup", "CupCap", "Curl", "CurlyDoubleQuote", "CurlyQuote",%
2740    "CurrencyConvert", "CurrentImage", "CurrentlySpeakingPacket",%
2741    "CurrentValue", "CurvatureFlowFilter", "CurveClosed", "Cyan",%
2742    "CycleGraph", "CycleIndexPolynomial", "Cycles", "CyclicGroup",%
2743    "Cyclotomic", "Cylinder", "CylinderBox", "CylindricalDecomposition",%
2744    "D", "DagumDistribution", "DamData", "DamerauLevenshteinDistance",%
2745    "DampingFactor", "Darker", "Dashed", "Dashing", "Databin",%
2746    "DatabinAdd", "DatabinRemove", "Databins", "DatabinUpload",%
2747    "DataCompression", "DataDistribution", "DataRange", "DataReversed",%
2748    "Dataset", "Date", "DateBounds", "Dated", "DateDelimiters",%
2749    "DateDifference", "DatedUnit", "DateFormat", "DateFunction",%
2750    "DateHistogram", "DateList", "DateListLogPlot", "DateListPlot",%
2751    "DateListStepPlot", "DateObject", "DateObjectQ", "DatePattern",%
2752    "DatePlus", "DateRange", "DateReduction", "DateString",%
2753    "DateTicksFormat", "DateValue", "DaubechiesWavelet",%
2754    "DavisDistribution", "DawsonF", "DayCount", "DayCountConvention",%
2755    "DayHemisphere", "DaylightQ", "DayMatchQ", "DayName",%
2756    "DayNightTerminator", "DayPlus", "DayRange", "DayRound",%
2757    "DeBruijnGraph", "Debug", "DebugTag", "Decapitalize", "Decimal",%
2758    "DeclareKnownSymbols", "DeclarePackage", "Decompose",%
2759    "DeconvolutionLayer", "Decrement", "Decrypt", "DedekindEta",%
2760    "DeepSpaceProbeData", "Default", "DefaultAxesStyle",%
2761    "DefaultBaseStyle", "DefaultBoxStyle", "DefaultButton",%
2762    "DefaultColor", "DefaultControlPlacement",%
2763    "DefaultDuplicateCellStyle", "DefaultDuration", "DefaultElement",%
2764    "DefaultFaceGridsStyle", "DefaultFieldHintStyle", "DefaultFont",%
2765    "DefaultFontProperties", "DefaultFormatType",%
```

```
2766    "DefaultFormatTypeForStyle", "DefaultFrameStyle",%
2767    "DefaultFrameTicksStyle", "DefaultGridLinesStyle",%
2768    "DefaultInlineFormatType", "DefaultInputFormatType",%
2769    "DefaultLabelStyle", "DefaultMenuStyle", "DefaultNaturalLanguage",%
2770    "DefaultNewCellStyle", "DefaultNewInlineCellStyle",%
2771    "DefaultNotebook", "DefaultOptions", "DefaultOutputFormatType",%
2772    "DefaultStyle", "DefaultStyleDefinitions", "DefaultTextFormatType",%
2773    "DefaultTextInlineFormatType", "DefaultTicksStyle",%
2774    "DefaultTooltipStyle", "DefaultValue", "DefaultValues", "Defer",%
2775    "DefineExternal", "DefineInputStreamMethod",%
2776    "DefineOutputStreamMethod", "Definition", "Degree",%
2777    "DegreeCentrality", "DegreeGraphDistribution", "DegreeLexicographic",%
2778    "DegreeReverseLexicographic", "DEigensystem", "DEigenvalues",%
2779    "Deinitialization", "Del", "DelaunayMesh", "Delayed", "Deletable",%
2780    "Delete", "DeleteBorderComponents", "DeleteCases", "DeleteChannel",%
2781    "DeleteCloudExpression", "DeleteContents", "DeleteDirectory",%
2782    "DeleteDuplicates", "DeleteDuplicatesBy", "DeleteFile",%
2783    "DeleteMissing", "DeletePermissionsKey", "DeleteSearchIndex",%
2784    "DeleteSmallComponents", "DeleteStopwords", "DeleteWithContents",%
2785    "DeletionWarning", "DelimitedArray", "DelimitedSequence",%
2786    "Delimiter", "DelimiterFlashTime", "DelimiterMatching", "Delimiters",%
2787    "DeliveryFunction", "Dendrogram", "Denominator", "DensityGraphics",%
2788    "DensityHistogram", "DensityPlot", "DensityPlot3D",%
2789    "DependentVariables", "Deploy", "Deployed", "Depth",%
2790    "DepthFirstScan", "Derivative", "DerivativeFilter",%
2791    "DescriptorStateSpace", "DesignMatrix", "DestroyAfterEvaluation",%
2792    "Det", "DeviceClose", "DeviceConfigure", "DeviceExecute",%
2793    "DeviceExecuteAsynchronous", "DeviceObject", "DeviceOpen",%
2794    "DeviceOpenQ", "DeviceRead", "DeviceReadBuffer", "DeviceReadLatest",%
2795    "DeviceReadList", "DeviceReadTimeSeries", "Devices", "DeviceStreams",%
2796    "DeviceWrite", "DeviceWriteBuffer", "DGaussianWavelet",%
2797    "DiacriticalPositioning", "Diagonal", "DiagonalizableMatrixQ",%
2798    "DiagonalMatrix", "Dialog", "DialogIndent", "DialogInput",%
2799    "DialogLevel", "DialogNotebook", "DialogProlog", "DialogReturn",%
2800    "DialogSymbols", "Diamond", "DiamondMatrix", "DiceDissimilarity",%
2801    "DictionaryLookup", "DictionaryWordQ", "DifferenceDelta",%
2802    "DifferenceOrder", "DifferenceQuotient", "DifferenceRoot",%
2803    "DifferenceRootReduce", "Differences", "DifferentialD",%
2804    "DifferentialRoot", "DifferentialRootReduce", "DifferentiatorFilter",%
2805    "DigitBlock", "DigitBlockMinimum", "DigitCharacter", "DigitCount",%
2806    "DigitQ", "DihedralGroup", "Dilation", "DimensionalCombinations",%
2807    "DimensionalMeshComponents", "DimensionReduce",%
2808    "DimensionReducerFunction", "DimensionReduction", "Dimensions",%
2809    "DiracComb", "DiracDelta", "DirectedEdge", "DirectedEdges",%
2810    "DirectedGraph", "DirectedGraphQ", "DirectedInfinity", "Direction",%
2811    "Directive", "Directory", "DirectoryName", "DirectoryQ",%
2812    "DirectoryStack", "DirichletBeta", "DirichletCharacter",%
2813    "DirichletCondition", "DirichletConvolve", "DirichletDistribution",%
2814    "DirichletEta", "DirichletL", "DirichletLambda",%
2815    "DirichletTransform", "DirichletWindow", "DisableConsolePrintPacket",%
2816    "DiscreteChirpZTransform", "DiscreteConvolve", "DiscreteDelta",%
2817    "DiscreteHadamardTransform", "DiscreteIndicator",%
2818    "DiscreteLQEstimatorGains", "DiscreteLQRegulatorGains",%
2819    "DiscreteLyapunovSolve", "DiscreteMarkovProcess", "DiscretePlot",%
```

66

```
2820     "DiscretePlot3D", "DiscreteRatio", "DiscreteRiccatiSolve",%
2821     "DiscreteShift", "DiscreteTimeModelQ", "DiscreteUniformDistribution",%
2822     "DiscreteVariables", "DiscreteWaveletData",%
2823     "DiscreteWaveletPacketTransform", "DiscreteWaveletTransform",%
2824     "DiscretizeGraphics", "DiscretizeRegion", "Discriminant",%
2825     "DisjointQ", "Disjunction", "Disk", "DiskBox", "DiskMatrix",%
2826     "DiskSegment", "Dispatch", "DispatchQ",%
2827     "DispersionEstimatorFunction", "Display", "DisplayAllSteps",%
2828     "DisplayEndPacket", "DisplayFlushImagePacket", "DisplayForm",%
2829     "DisplayFunction", "DisplayPacket", "DisplayRules",%
2830     "DisplaySetSizePacket", "DisplayString", "DisplayTemporary",%
2831     "DisplayWith", "DisplayWithRef", "DisplayWithVariable",%
2832     "DistanceFunction", "DistanceMatrix", "DistanceTransform",%
2833     "Distribute", "Distributed", "DistributedContexts",%
2834     "DistributeDefinitions", "DistributionChart", "DistributionDomain",%
2835     "DistributionFitTest", "DistributionParameterAssumptions",%
2836     "DistributionParameterQ", "Dithering", "Div", "Divergence", "Divide",%
2837     "DivideBy", "Dividers", "Divisible", "Divisors", "DivisorSigma",%
2838     "DivisorSum", "DMSList", "DMSString", "Do", "DockedCells",%
2839     "DocumentGenerator", "DocumentGeneratorInformation",%
2840     "DocumentGeneratorInformationData", "DocumentGenerators",%
2841     "DocumentNotebook", "DominantColors", "DOSTextFormat", "Dot",%
2842     "DotDashed", "DotEqual", "DotPlusLayer", "Dotted",%
2843     "DoubleBracketingBar", "DoubleContourIntegral", "DoubleDownArrow",%
2844     "DoubleLeftArrow", "DoubleLeftRightArrow", "DoubleLeftTee",%
2845     "DoubleLongLeftArrow", "DoubleLongLeftRightArrow",%
2846     "DoubleLongRightArrow", "DoubleRightArrow", "DoubleRightTee",%
2847     "DoubleUpArrow", "DoubleUpDownArrow", "DoubleVerticalBar",%
2848     "DoublyInfinite", "Down", "DownArrow", "DownArrowBar",%
2849     "DownArrowUpArrow", "DownLeftRightVector", "DownLeftTeeVector",%
2850     "DownLeftVector", "DownLeftVectorBar", "DownRightTeeVector",%
2851     "DownRightVector", "DownRightVectorBar", "Downsample", "DownTee",%
2852     "DownTeeArrow", "DownValues", "DragAndDrop", "DrawEdges",%
2853     "DrawFrontFaces", "DrawHighlighted", "Drop", "DropoutLayer",%
2854     "DSolve", "DSolveValue", "Dt", "DualLinearProgramming",%
2855     "DualSystemsModel", "DumpGet", "DumpSave", "DuplicateFreeQ",%
2856     "Duration", "Dynamic", "DynamicBox", "DynamicBoxOptions",%
2857     "DynamicEvaluationTimeout", "DynamicGeoGraphics", "DynamicImage",%
2858     "DynamicLocation", "DynamicModule", "DynamicModuleBox",%
2859     "DynamicModuleBoxOptions", "DynamicModuleParent",%
2860     "DynamicModuleValues", "DynamicName", "DynamicNamespace",%
2861     "DynamicReference", "DynamicSetting", "DynamicUpdating",%
2862     "DynamicWrapper", "DynamicWrapperBox", "DynamicWrapperBoxOptions",%
2863     "E", "EarthImpactData", "EarthquakeData", "EccentricityCentrality",%
2864     "Echo", "EchoFunction", "EclipseType", "EdgeAdd",%
2865     "EdgeBetweennessCentrality", "EdgeCapacity", "EdgeCapForm",%
2866     "EdgeColor", "EdgeConnectivity", "EdgeContract", "EdgeCost",%
2867     "EdgeCount", "EdgeCoverQ", "EdgeCycleMatrix", "EdgeDashing",%
2868     "EdgeDelete", "EdgeDetect", "EdgeForm", "EdgeIndex", "EdgeJoinForm",%
2869     "EdgeLabeling", "EdgeLabels", "EdgeLabelStyle", "EdgeList",%
2870     "EdgeOpacity", "EdgeQ", "EdgeRenderingFunction", "EdgeRules",%
2871     "EdgeShapeFunction", "EdgeStyle", "EdgeThickness", "EdgeWeight",%
2872     "Editable", "EditButtonSettings", "EditCellTagsSettings",%
2873     "EditDistance", "EffectiveInterest", "Eigensystem", "Eigenvalues",%
```

```
2874    "EigenvectorCentrality", "Eigenvectors", "Element", "ElementData",%
2875    "ElementwiseLayer", "ElidedForms", "Eliminate", "EliminationOrder",%
2876    "Ellipsoid", "EllipticE", "EllipticExp", "EllipticExpPrime",%
2877    "EllipticF", "EllipticFilterModel", "EllipticK", "EllipticLog",%
2878    "EllipticNomeQ", "EllipticPi", "EllipticReducedHalfPeriods",%
2879    "EllipticTheta", "EllipticThetaPrime", "EmbedCode", "EmbeddedHTML",%
2880    "EmbeddedService", "EmbeddingLayer", "EmbeddingObject", "EmitSound",%
2881    "EmphasizeSyntaxErrors", "EmpiricalDistribution", "Empty",%
2882    "EmptyGraphQ", "EmptyRegion", "EnableConsolePrintPacket", "Enabled",%
2883    "Encode", "Encrypt", "EncryptedObject", "End", "EndAdd",%
2884    "EndDialogPacket", "EndFrontEndInteractionPacket", "EndOfBuffer",%
2885    "EndOfFile", "EndOfLine", "EndOfString", "EndPackage",%
2886    "EngineEnvironment", "EngineeringForm", "Enter",%
2887    "EnterExpressionPacket", "EnterTextPacket", "Entity", "EntityClass",%
2888    "EntityClassList", "EntityCopies", "EntityGroup", "EntityInstance",%
2889    "EntityList", "EntityProperties", "EntityProperty",%
2890    "EntityPropertyClass", "EntityStore", "EntityTypeName",%
2891    "EntityValue", "Entropy", "EntropyFilter", "Environment", "Epilog",%
2892    "EpilogFunction", "Equal", "EqualColumns", "EqualRows", "EqualTilde",%
2893    "EqualTo", "EquatedTo", "Equilibrium", "EquirippleFilterKernel",%
2894    "Equivalent", "Erf", "Erfc", "Erfi", "ErlangB", "ErlangC",%
2895    "ErlangDistribution", "Erosion", "ErrorBox", "ErrorBoxOptions",%
2896    "ErrorNorm", "ErrorPacket", "ErrorsDialogSettings", "EscapeRadius",%
2897    "EstimatedBackground", "EstimatedDistribution", "EstimatedProcess",%
2898    "EstimatorGains", "EstimatorRegulator", "EuclideanDistance",%
2899    "EulerAngles", "EulerE", "EulerGamma", "EulerianGraphQ",%
2900    "EulerMatrix", "EulerPhi", "Evaluatable", "Evaluate", "Evaluated",%
2901    "EvaluatePacket", "EvaluateScheduledTask", "EvaluationBox",%
2902    "EvaluationCell", "EvaluationCompletionAction", "EvaluationData",%
2903    "EvaluationElements", "EvaluationMode", "EvaluationMonitor",%
2904    "EvaluationNotebook", "EvaluationObject", "EvaluationOrder",%
2905    "Evaluator", "EvaluatorNames", "EvenQ", "EventData",%
2906    "EventEvaluator", "EventHandler", "EventHandlerTag", "EventLabels",%
2907    "EventSeries", "ExactBlackmanWindow", "ExactNumberQ",%
2908    "ExactRootIsolation", "ExampleData", "Except", "ExcludedForms",%
2909    "ExcludedLines", "ExcludedPhysicalQuantities", "ExcludePods",%
2910    "Exclusions", "ExclusionsStyle", "Exists", "Exit", "ExitDialog",%
2911    "ExoplanetData", "Exp", "Expand", "ExpandAll", "ExpandDenominator",%
2912    "ExpandFileName", "ExpandNumerator", "Expectation", "ExpectationE",%
2913    "ExpectedValue", "ExpGammaDistribution", "ExpIntegralE",%
2914    "ExpIntegralEi", "Exponent", "ExponentFunction",%
2915    "ExponentialDistribution", "ExponentialFamily",%
2916    "ExponentialGeneratingFunction", "ExponentialMovingAverage",%
2917    "ExponentialPowerDistribution", "ExponentPosition", "ExponentStep",%
2918    "Export", "ExportAutoReplacements", "ExportForm", "ExportPacket",%
2919    "ExportString", "Expression", "ExpressionCell", "ExpressionPacket",%
2920    "ExpressionUUID", "ExpToTrig", "ExtendedGCD", "ExtensibleParameters",%
2921    "Extension", "ExtentElementFunction", "ExtentMarkers", "ExtentSize",%
2922    "ExternalBundle", "ExternalCall", "ExternalDataCharacterEncoding",%
2923    "ExternalFunctionName", "ExternalOptions", "ExternalTypeSignature",%
2924    "Extract", "ExtractArchive", "ExtremeValueDistribution", "FaceForm",%
2925    "FaceGrids", "FaceGridsStyle", "Factor", "FactorComplete",%
2926    "Factorial", "Factorial2", "FactorialMoment",%
2927    "FactorialMomentGeneratingFunction", "FactorialPower",%
```

```
2928     "FactorInteger", "FactorList", "FactorSquareFree",%
2929     "FactorSquareFreeList", "FactorTerms", "FactorTermsList", "Fail",%
2930     "Failure", "FailureAction", "FailureDistribution", "FailureQ",%
2931     "False", "FareySequence", "FARIMAProcess", "FeatureDistance",%
2932     "FeatureExtract", "FeatureExtraction", "FeatureExtractor",%
2933     "FeatureExtractorFunction", "FeatureNames", "FeatureTypes",%
2934     "FEDisableConsolePrintPacket", "FeedbackLinearize", "FeedbackSector",%
2935     "FeedbackSectorStyle", "FeedbackType", "FEEnableConsolePrintPacket",%
2936     "FetalGrowthData", "Fibonacci", "Fibonorial", "FieldHint",%
2937     "FieldHintStyle", "FieldMasked", "FieldSize", "File", "FileBaseName",%
2938     "FileByteCount", "FileDate", "FileExistsQ", "FileExtension",%
2939     "FileFormat", "FileHash", "FileInformation", "FileName",%
2940     "FileNameDepth", "FileNameDialogSettings", "FileNameDrop",%
2941     "FileNameForms", "FileNameJoin", "FileNames", "FileNameSetter",%
2942     "FileNameSplit", "FileNameTake", "FilePrint", "FileSystemMap",%
2943     "FileSystemScan", "FileTemplate", "FileTemplateApply", "FileType",%
2944     "FilledCurve", "FilledCurveBox", "FilledCurveBoxOptions", "Filling",%
2945     "FillingStyle", "FillingTransform", "FilterRules", "FinancialBond",%
2946     "FinancialData", "FinancialDerivative", "FinancialIndicator", "Find",%
2947     "FindArgMax", "FindArgMin", "FindChannels", "FindClique",%
2948     "FindClusters", "FindCookies", "FindCurvePath", "FindCycle",%
2949     "FindDevices", "FindDistribution", "FindDistributionParameters",%
2950     "FindDivisions", "FindEdgeCover", "FindEdgeCut",%
2951     "FindEdgeIndependentPaths", "FindEulerianCycle", "FindFaces",%
2952     "FindFile", "FindFit", "FindFormula", "FindFundamentalCycles",%
2953     "FindGeneratingFunction", "FindGeoLocation",%
2954     "FindGeometricTransform", "FindGraphCommunities",%
2955     "FindGraphIsomorphism", "FindGraphPartition", "FindHamiltonianCycle",%
2956     "FindHamiltonianPath", "FindHiddenMarkovStates",%
2957     "FindIndependentEdgeSet", "FindIndependentVertexSet", "FindInstance",%
2958     "FindIntegerNullVector", "FindKClan", "FindKClique", "FindKClub",%
2959     "FindKPlex", "FindLibrary", "FindLinearRecurrence", "FindList",%
2960     "FindMaximum", "FindMaximumFlow", "FindMaxValue", "FindMeshDefects",%
2961     "FindMinimum", "FindMinimumCostFlow", "FindMinimumCut",%
2962     "FindMinValue", "FindPath", "FindPeaks", "FindPermutation",%
2963     "FindPostmanTour", "FindProcessParameters", "FindRoot",%
2964     "FindSequenceFunction", "FindSettings", "FindShortestPath",%
2965     "FindShortestTour", "FindSpanningTree", "FindThreshold",%
2966     "FindTransientRepeat", "FindVertexCover", "FindVertexCut",%
2967     "FindVertexIndependentPaths", "Fine", "FinishDynamic",%
2968     "FiniteAbelianGroupCount", "FiniteGroupCount", "FiniteGroupData",%
2969     "First", "FirstCase", "FirstPassageTimeDistribution",%
2970     "FirstPosition", "FischerGroupFi22", "FischerGroupFi23",%
2971     "FischerGroupFi24Prime", "FisherHypergeometricDistribution",%
2972     "FisherRatioTest", "FisherZDistribution", "Fit", "FitAll",%
2973     "FittedModel", "FixedOrder", "FixedPoint", "FixedPointList",%
2974     "FlashSelection", "Flat", "Flatten", "FlattenAt", "FlattenLayer",%
2975     "FlatTopWindow", "FlipView", "Floor", "FlowPolynomial",%
2976     "FlushPrintOutputPacket", "Fold", "FoldList", "FoldPair",%
2977     "FoldPairList", "FollowRedirects", "Font", "FontColor", "FontFamily",%
2978     "FontForm", "FontName", "FontOpacity", "FontPostScriptName",%
2979     "FontProperties", "FontReencoding", "FontSize", "FontSlant",%
2980     "FontSubstitutions", "FontTracking", "FontVariations", "FontWeight",%
2981     "For", "ForAll", "Format", "FormatRules", "FormatType",%
```

```
2982    "FormatTypeAutoConvert", "FormatValues", "FormBox", "FormBoxOptions",%
2983    "FormControl", "FormFunction", "FormLayoutFunction", "FormObject",%
2984    "FormPage", "FormTheme", "FormulaData", "FormulaLookup",%
2985    "FortranForm", "Forward", "ForwardBackward", "Fourier",%
2986    "FourierCoefficient", "FourierCosCoefficient", "FourierCosSeries",%
2987    "FourierCosTransform", "FourierDCT", "FourierDCTFilter",%
2988    "FourierDCTMatrix", "FourierDST", "FourierDSTMatrix",%
2989    "FourierMatrix", "FourierParameters", "FourierSequenceTransform",%
2990    "FourierSeries", "FourierSinCoefficient", "FourierSinSeries",%
2991    "FourierSinTransform", "FourierTransform", "FourierTrigSeries",%
2992    "FractionalBrownianMotionProcess", "FractionalGaussianNoiseProcess",%
2993    "FractionalPart", "FractionBox", "FractionBoxOptions",%
2994    "FractionLine", "Frame", "FrameBox", "FrameBoxOptions", "Framed",%
2995    "FrameInset", "FrameLabel", "Frameless", "FrameMargins",%
2996    "FrameStyle", "FrameTicks", "FrameTicksStyle", "FRatioDistribution",%
2997    "FrechetDistribution", "FreeQ", "FrenetSerretSystem",%
2998    "FrequencySamplingFilterKernel", "FresnelC", "FresnelF", "FresnelG",%
2999    "FresnelS", "Friday", "FrobeniusNumber", "FrobeniusSolve",%
3000    "FromCharacterCode", "FromCoefficientRules", "FromContinuedFraction",%
3001    "FromDate", "FromDigits", "FromDMS", "FromEntity", "FromJulianDate",%
3002    "FromLetterNumber", "FromPolarCoordinates", "FromRomanNumeral",%
3003    "FromSphericalCoordinates", "FromUnixTime", "Front",%
3004    "FrontEndDynamicExpression", "FrontEndEventActions",%
3005    "FrontEndExecute", "FrontEndObject", "FrontEndResource",%
3006    "FrontEndResourceString", "FrontEndStackSize", "FrontEndToken",%
3007    "FrontEndTokenExecute", "FrontEndValueCache", "FrontEndVersion",%
3008    "FrontFaceColor", "FrontFaceOpacity", "Full", "FullAxes",%
3009    "FullDefinition", "FullForm", "FullGraphics",%
3010    "FullInformationOutputRegulator", "FullOptions", "FullRegion",%
3011    "FullSimplify", "Function", "FunctionDomain", "FunctionExpand",%
3012    "FunctionInterpolation", "FunctionPeriod", "FunctionRange",%
3013    "FunctionSpace", "FussellVeselyImportance", "GaborFilter",%
3014    "GaborMatrix", "GaborWavelet", "GainMargins", "GainPhaseMargins",%
3015    "GalaxyData", "GalleryView", "Gamma", "GammaDistribution",%
3016    "GammaRegularized", "GapPenalty", "GARCHProcess", "Gather",%
3017    "GatherBy", "GaugeFaceElementFunction", "GaugeFaceStyle",%
3018    "GaugeFrameElementFunction", "GaugeFrameSize", "GaugeFrameStyle",%
3019    "GaugeLabels", "GaugeMarkers", "GaugeStyle", "GaussianFilter",%
3020    "GaussianIntegers", "GaussianMatrix",%
3021    "GaussianOrthogonalMatrixDistribution",%
3022    "GaussianSymplecticMatrixDistribution",%
3023    "GaussianUnitaryMatrixDistribution", "GaussianWindow", "GCD",%
3024    "GegenbauerC", "General", "GeneralizedLinearModelFit",%
3025    "GenerateAsymmetricKeyPair", "GenerateConditions", "GeneratedCell",%
3026    "GeneratedDocumentBinding", "GenerateDocument",%
3027    "GeneratedParameters", "GenerateHTTPResponse",%
3028    "GenerateSymmetricKey", "GeneratingFunction", "GeneratorDescription",%
3029    "GeneratorHistoryLength", "GeneratorOutputType", "Generic",%
3030    "GenericCylindricalDecomposition", "GenomeData", "GenomeLookup",%
3031    "GeoArea", "GeoBackground", "GeoBoundingBox", "GeoBounds",%
3032    "GeoBoundsRegion", "GeoCenter", "GeoCircle", "GeodesicClosing",%
3033    "GeodesicDilation", "GeodesicErosion", "GeodesicOpening",%
3034    "GeoDestination", "GeodesyData", "GeoDirection", "GeoDisk",%
3035    "GeoDisplacement", "GeoDistance", "GeoDistanceList",%
```

```
3036        "GeoElevationData", "GeoEntities", "GeoGraphics",%
3037        "GeogravityModelData", "GeoGridLines", "GeoGridLinesStyle",%
3038        "GeoGridPosition", "GeoGroup", "GeoHemisphere",%
3039        "GeoHemisphereBoundary", "GeoHistogram", "GeoIdentify", "GeoLabels",%
3040        "GeoLength", "GeoListPlot", "GeoLocation", "GeologicalPeriodData",%
3041        "GeomagneticModelData", "GeoMarker",%
3042        "GeometricBrownianMotionProcess", "GeometricDistribution",%
3043        "GeometricMean", "GeometricMeanFilter", "GeometricTransformation",%
3044        "GeometricTransformation3DBox",%
3045        "GeometricTransformation3DBoxOptions", "GeometricTransformationBox",%
3046        "GeometricTransformationBoxOptions", "GeoModel", "GeoNearest",%
3047        "GeoPath", "GeoPosition", "GeoPositionENU", "GeoPositionXYZ",%
3048        "GeoProjection", "GeoProjectionData", "GeoRange", "GeoRangePadding",%
3049        "GeoRegionValuePlot", "GeoScaleBar", "GeoServer", "GeoStyling",%
3050        "GeoStylingImageFunction", "GeoVariant", "GeoVisibleRegion",%
3051        "GeoVisibleRegionBoundary", "GeoWithinQ", "GeoZoomLevel",%
3052        "GestureHandler", "GestureHandlerTag", "Get",%
3053        "GetBoundingBoxSizePacket", "GetContext", "GetEnvironment",%
3054        "GetFileName", "GetFrontEndOptionsDataPacket",%
3055        "GetLinebreakInformationPacket", "GetMenusPacket",%
3056        "GetPageBreakInformationPacket", "Glaisher",%
3057        "GlobalClusteringCoefficient", "GlobalPreferences", "GlobalSession",%
3058        "Glow", "GoldenAngle", "GoldenRatio", "GompertzMakehamDistribution",%
3059        "GoodmanKruskalGamma", "GoodmanKruskalGammaTest", "Goto", "Grad",%
3060        "Gradient", "GradientFilter", "GradientOrientationFilter",%
3061        "GrammarApply", "GrammarRules", "GrammarToken", "Graph", "Graph3D",%
3062        "GraphAssortativity", "GraphAutomorphismGroup", "GraphCenter",%
3063        "GraphComplement", "GraphData", "GraphDensity", "GraphDiameter",%
3064        "GraphDifference", "GraphDisjointUnion", "GraphDistance",%
3065        "GraphDistanceMatrix", "GraphElementData", "GraphEmbedding",%
3066        "GraphHighlight", "GraphHighlightStyle", "GraphHub", "Graphics",%
3067        "Graphics3D", "Graphics3DBox", "Graphics3DBoxOptions",%
3068        "GraphicsArray", "GraphicsBaseline", "GraphicsBox",%
3069        "GraphicsBoxOptions", "GraphicsColor", "GraphicsColumn",%
3070        "GraphicsComplex", "GraphicsComplex3DBox",%
3071        "GraphicsComplex3DBoxOptions", "GraphicsComplexBox",%
3072        "GraphicsComplexBoxOptions", "GraphicsContents", "GraphicsData",%
3073        "GraphicsGrid", "GraphicsGridBox", "GraphicsGroup",%
3074        "GraphicsGroup3DBox", "GraphicsGroup3DBoxOptions",%
3075        "GraphicsGroupBox", "GraphicsGroupBoxOptions", "GraphicsGrouping",%
3076        "GraphicsHighlightColor", "GraphicsRow", "GraphicsSpacing",%
3077        "GraphicsStyle", "GraphIntersection", "GraphLayout",%
3078        "GraphLinkEfficiency", "GraphPeriphery", "GraphPlot", "GraphPlot3D",%
3079        "GraphPower", "GraphPropertyDistribution", "GraphQ", "GraphRadius",%
3080        "GraphReciprocity", "GraphRoot", "GraphStyle", "GraphUnion", "Gray",%
3081        "GrayLevel", "Greater", "GreaterEqual", "GreaterEqualLess",%
3082        "GreaterEqualThan", "GreaterFullEqual", "GreaterGreater",%
3083        "GreaterLess", "GreaterSlantEqual", "GreaterThan", "GreaterTilde",%
3084        "Green", "GreenFunction", "Grid", "GridBaseline", "GridBox",%
3085        "GridBoxAlignment", "GridBoxBackground", "GridBoxDividers",%
3086        "GridBoxFrame", "GridBoxItemSize", "GridBoxItemStyle",%
3087        "GridBoxOptions", "GridBoxSpacings", "GridCreationSettings",%
3088        "GridDefaultElement", "GridElementStyleOptions", "GridFrame",%
3089        "GridFrameMargins", "GridGraph", "GridLines", "GridLinesStyle",%
```

71

```
3090    "GroebnerBasis", "GroupActionBase", "GroupBy", "GroupCentralizer",%
3091    "GroupElementFromWord", "GroupElementPosition", "GroupElementQ",%
3092    "GroupElements", "GroupElementToWord", "GroupGenerators",%
3093    "Groupings", "GroupMultiplicationTable", "GroupOrbits", "GroupOrder",%
3094    "GroupPageBreakWithin", "GroupSetwiseStabilizer", "GroupStabilizer",%
3095    "GroupStabilizerChain", "GroupTogetherGrouping",%
3096    "GroupTogetherNestedGrouping", "GrowCutComponents", "Gudermannian",%
3097    "GuidedFilter", "GumbelDistribution", "HaarWavelet",%
3098    "HadamardMatrix", "HalfLine", "HalfNormalDistribution", "HalfPlane",%
3099    "HalfSpace", "HamiltonianGraphQ", "HammingDistance", "HammingWindow",%
3100    "HandlerFunctions", "HandlerFunctionsKeys", "HankelH1", "HankelH2",%
3101    "HankelMatrix", "HannPoissonWindow", "HannWindow",%
3102    "HaradaNortonGroupHN", "HararyGraph", "HarmonicMean",%
3103    "HarmonicMeanFilter", "HarmonicNumber", "Hash", "Haversine",%
3104    "HazardFunction", "Head", "HeadCompose", "HeaderLines", "Heads",%
3105    "HeavisideLambda", "HeavisidePi", "HeavisideTheta", "HeldGroupHe",%
3106    "HeldPart", "HelpBrowserLookup", "HelpBrowserNotebook",%
3107    "HelpBrowserSettings", "Here", "HermiteDecomposition", "HermiteH",%
3108    "HermitianMatrixQ", "HessenbergDecomposition", "Hessian",%
3109    "HexadecimalCharacter", "Hexahedron", "HexahedronBox",%
3110    "HexahedronBoxOptions", "HiddenMarkovProcess", "HiddenSurface",%
3111    "Highlighted", "HighlightGraph", "HighlightImage", "HighlightMesh",%
3112    "HighpassFilter", "HigmanSimsGroupHS", "HilbertFilter",%
3113    "HilbertMatrix", "Histogram", "Histogram3D", "HistogramDistribution",%
3114    "HistogramList", "HistogramTransform",%
3115    "HistogramTransformInterpolation", "HistoricalPeriodData",%
3116    "HitMissTransform", "HITSCentrality", "HodgeDual", "HoeffdingD",%
3117    "HoeffdingDTest", "Hold", "HoldAll", "HoldAllComplete",%
3118    "HoldComplete", "HoldFirst", "HoldForm", "HoldPattern", "HoldRest",%
3119    "HolidayCalendar", "HomeDirectory", "HomePage", "Horizontal",%
3120    "HorizontalForm", "HorizontalGauge", "HorizontalScrollPosition",%
3121    "HornerForm", "HostLookup", "HotellingTSquareDistribution",%
3122    "HoytDistribution", "HTMLSave", "HTTPErrorResponse", "HTTPRedirect",%
3123    "HTTPRequest", "HTTPRequestData", "HTTPResponse", "Hue",%
3124    "HumanGrowthData", "HumpDownHump", "HumpEqual", "HurwitzLerchPhi",%
3125    "HurwitzZeta", "HyperbolicDistribution", "HypercubeGraph",%
3126    "HyperexponentialDistribution", "Hyperfactorial",%
3127    "Hypergeometric0F1", "Hypergeometric0F1Regularized",%
3128    "Hypergeometric1F1", "Hypergeometric1F1Regularized",%
3129    "Hypergeometric2F1", "Hypergeometric2F1Regularized",%
3130    "HypergeometricDistribution", "HypergeometricPFQ",%
3131    "HypergeometricPFQRegularized", "HypergeometricU", "Hyperlink",%
3132    "HyperlinkCreationSettings", "Hyperplane", "Hyphenation",%
3133    "HyphenationOptions", "HypoexponentialDistribution",%
3134    "HypothesisTestData", "I", "IconData", "IconRules", "Identity",%
3135    "IdentityMatrix", "If", "IgnoreCase", "IgnoreDiacritics",%
3136    "IgnorePunctuation", "IgnoringInactive", "Im", "Image", "Image3D",%
3137    "Image3DSlices", "ImageAccumulate", "ImageAdd", "ImageAdjust",%
3138    "ImageAlign", "ImageApply", "ImageApplyIndexed", "ImageAspectRatio",%
3139    "ImageAssemble", "ImageCache", "ImageCacheValid", "ImageCapture",%
3140    "ImageChannels", "ImageClip", "ImageCollage", "ImageColorSpace",%
3141    "ImageCompose", "ImageConvolve", "ImageCooccurrence", "ImageCorners",%
3142    "ImageCorrelate", "ImageCorrespondingPoints", "ImageCrop",%
3143    "ImageData", "ImageDeconvolve", "ImageDemosaic", "ImageDifference",%
```

```
3144    "ImageDimensions", "ImageDisplacements", "ImageDistance",%
3145    "ImageEffect", "ImageExposureCombine", "ImageFeatureTrack",%
3146    "ImageFileApply", "ImageFileFilter", "ImageFileScan", "ImageFilter",%
3147    "ImageFocusCombine", "ImageForestingComponents",%
3148    "ImageFormattingWidth", "ImageForwardTransformation",%
3149    "ImageHistogram", "ImageIdentify", "ImageInstanceQ",%
3150    "ImageKeypoints", "ImageLevels", "ImageLines", "ImageMargins",%
3151    "ImageMarker", "ImageMarkers", "ImageMeasurements", "ImageMesh",%
3152    "ImageMultiply", "ImageOffset", "ImagePad", "ImagePadding",%
3153    "ImagePartition", "ImagePeriodogram",%
3154    "ImagePerspectiveTransformation", "ImageQ", "ImageRangeCache",%
3155    "ImageReflect", "ImageRegion", "ImageResize", "ImageResolution",%
3156    "ImageRotate", "ImageRotated", "ImageSaliencyFilter", "ImageScaled",%
3157    "ImageScan", "ImageSize", "ImageSizeAction", "ImageSizeCache",%
3158    "ImageSizeMultipliers", "ImageSizeRaw", "ImageSubtract", "ImageTake",%
3159    "ImageTransformation", "ImageTrim", "ImageType", "ImageValue",%
3160    "ImageValuePositions", "ImagingDevice", "ImplicitRegion", "Implies",%
3161    "Import", "ImportAutoReplacements", "ImportOptions", "ImportString",%
3162    "ImprovementImportance", "In", "Inactivate", "Inactive",%
3163    "IncidenceGraph", "IncidenceList", "IncidenceMatrix",%
3164    "IncludeConstantBasis", "IncludeFileExtension",%
3165    "IncludeGeneratorTasks", "IncludeInflections",%
3166    "IncludeMetaInformation", "IncludePods", "IncludeQuantities",%
3167    "IncludeSingularTerm", "IncludeWindowTimes", "Increment",%
3168    "IndefiniteMatrixQ", "Indent", "IndentingNewlineSpacings",%
3169    "IndentMaxFraction", "IndependenceTest", "IndependentEdgeSetQ",%
3170    "IndependentUnit", "IndependentVertexSetQ", "Indeterminate",%
3171    "IndeterminateThreshold", "IndexCreationOptions", "Indexed",%
3172    "IndexGraph", "IndexTag", "Inequality", "InexactNumberQ",%
3173    "InexactNumbers", "InfiniteLine", "InfinitePlane", "Infinity",%
3174    "Infix", "InflationAdjust", "InflationMethod", "Information",%
3175    "Inherited", "InheritScope", "InhomogeneousPoissonProcess",%
3176    "InitialEvaluationHistory", "Initialization", "InitializationCell",%
3177    "InitializationCellEvaluation", "InitializationCellWarning",%
3178    "InlineCounterAssignments", "InlineCounterIncrements", "InlinePart",%
3179    "InlineRules", "Inner", "Inpaint", "Input", "InputAliases",%
3180    "InputAssumptions", "InputAutoReplacements", "InputField",%
3181    "InputFieldBox", "InputFieldBoxOptions", "InputForm",%
3182    "InputGrouping", "InputNamePacket", "InputNotebook", "InputPacket",%
3183    "InputSettings", "InputStream", "InputString", "InputStringPacket",%
3184    "InputToBoxFormPacket", "Insert", "InsertionFunction",%
3185    "InsertionPointObject", "InsertLinebreaks", "InsertResults", "Inset",%
3186    "Inset3DBox", "Inset3DBoxOptions", "InsetBox", "InsetBoxOptions",%
3187    "Insphere", "Install", "InstallService", "InString", "Integer",%
3188    "IntegerDigits", "IntegerExponent", "IntegerLength", "IntegerName",%
3189    "IntegerPart", "IntegerPartitions", "IntegerQ", "IntegerReverse",%
3190    "Integers", "IntegerString", "Integral", "Integrate", "Interactive",%
3191    "InteractiveTradingChart", "Interlaced", "Interleaving",%
3192    "InternallyBalancedDecomposition", "InterpolatingFunction",%
3193    "InterpolatingPolynomial", "Interpolation", "InterpolationOrder",%
3194    "InterpolationPoints", "InterpolationPrecision", "Interpretation",%
3195    "InterpretationBox", "InterpretationBoxOptions",%
3196    "InterpretationFunction", "Interpreter", "InterpretTemplate",%
3197    "InterquartileRange", "Interrupt", "InterruptSettings",%
```

```
3198    "IntersectingQ", "Intersection", "Interval", "IntervalIntersection",%
3199    "IntervalMemberQ", "IntervalSlider", "IntervalUnion", "Into",%
3200    "Inverse", "InverseBetaRegularized", "InverseCDF",%
3201    "InverseChiSquareDistribution", "InverseContinuousWaveletTransform",%
3202    "InverseDistanceTransform", "InverseEllipticNomeQ", "InverseErf",%
3203    "InverseErfc", "InverseFourier", "InverseFourierCosTransform",%
3204    "InverseFourierSequenceTransform", "InverseFourierSinTransform",%
3205    "InverseFourierTransform", "InverseFunction", "InverseFunctions",%
3206    "InverseGammaDistribution", "InverseGammaRegularized",%
3207    "InverseGaussianDistribution", "InverseGudermannian",%
3208    "InverseHaversine", "InverseJacobiCD", "InverseJacobiCN",%
3209    "InverseJacobiCS", "InverseJacobiDC", "InverseJacobiDN",%
3210    "InverseJacobiDS", "InverseJacobiNC", "InverseJacobiND",%
3211    "InverseJacobiNS", "InverseJacobiSC", "InverseJacobiSD",%
3212    "InverseJacobiSN", "InverseLaplaceTransform",%
3213    "InverseMellinTransform", "InversePermutation", "InverseRadon",%
3214    "InverseSeries", "InverseSurvivalFunction",%
3215    "InverseTransformedRegion", "InverseWaveletTransform",%
3216    "InverseWeierstrassP", "InverseWishartMatrixDistribution",%
3217    "InverseZTransform", "Invisible", "InvisibleApplication",%
3218    "InvisibleTimes", "IPAddress", "IrreduciblePolynomialQ",%
3219    "IslandData", "IsolatingInterval", "IsomorphicGraphQ", "IsotopeData",%
3220    "Italic", "Item", "ItemAspectRatio", "ItemBox", "ItemBoxOptions",%
3221    "ItemSize", "ItemStyle", "ItoProcess", "JaccardDissimilarity",%
3222    "JacobiAmplitude", "Jacobian", "JacobiCD", "JacobiCN", "JacobiCS",%
3223    "JacobiDC", "JacobiDN", "JacobiDS", "JacobiNC", "JacobiND",%
3224    "JacobiNS", "JacobiP", "JacobiSC", "JacobiSD", "JacobiSN",%
3225    "JacobiSymbol", "JacobiZeta", "JankoGroupJ1", "JankoGroupJ2",%
3226    "JankoGroupJ3", "JankoGroupJ4", "JarqueBeraALMTest",%
3227    "JohnsonDistribution", "Join", "JoinAcross", "Joined", "JoinedCurve",%
3228    "JoinedCurveBox", "JoinedCurveBoxOptions", "JoinForm",%
3229    "JordanDecomposition", "JordanModelDecomposition", "JulianDate",%
3230    "JuliaSetBoettcher", "JuliaSetIterationCount", "JuliaSetPlot",%
3231    "JuliaSetPoints", "K", "KagiChart", "KaiserBesselWindow",%
3232    "KaiserWindow", "KalmanEstimator", "KalmanFilter",%
3233    "KarhunenLoeveDecomposition", "KaryTree", "KatzCentrality",%
3234    "KCoreComponents", "KDistribution", "KEdgeConnectedComponents",%
3235    "KEdgeConnectedGraphQ", "KelvinBei", "KelvinBer", "KelvinKei",%
3236    "KelvinKer", "KendallTau", "KendallTauTest", "KernelExecute",%
3237    "KernelMixtureDistribution", "Kernels", "Ket", "Key",%
3238    "KeyCollisionFunction", "KeyComplement", "KeyDrop", "KeyDropFrom",%
3239    "KeyExistsQ", "KeyFreeQ", "KeyIntersection", "KeyMap", "KeyMemberQ",%
3240    "KeypointStrength", "Keys", "KeySelect", "KeySort", "KeySortBy",%
3241    "KeyTake", "KeyUnion", "KeyValueMap", "KeyValuePattern", "Khinchin",%
3242    "KillProcess", "KirchhoffGraph", "KirchhoffMatrix",%
3243    "KleinInvariantJ", "KnapsackSolve", "KnightTourGraph", "KnotData",%
3244    "KnownUnitQ", "KolmogorovSmirnovTest", "KroneckerDelta",%
3245    "KroneckerModelDecomposition", "KroneckerProduct", "KroneckerSymbol",%
3246    "KuiperTest", "KumaraswamyDistribution", "Kurtosis",%
3247    "KuwaharaFilter", "KVertexConnectedComponents",%
3248    "KVertexConnectedGraphQ", "LABColor", "Label", "Labeled",%
3249    "LabeledSlider", "LabelingFunction", "LabelStyle", "LaguerreL",%
3250    "LakeData", "LambdaComponents", "LambertW", "LaminaData",%
3251    "LanczosWindow", "LandauDistribution", "Language",%
```

```
3252    "LanguageCategory", "LanguageData", "LanguageIdentify",%
3253    "LaplaceDistribution", "LaplaceTransform", "Laplacian",%
3254    "LaplacianFilter", "LaplacianGaussianFilter", "Large", "Larger",%
3255    "Last", "Latitude", "LatitudeLongitude", "LatticeData",%
3256    "LatticeReduce", "Launch", "LaunchKernels", "LayeredGraphPlot",%
3257    "LayerSizeFunction", "LayoutInformation", "LCHColor", "LCM",%
3258    "LeaderSize", "LeafCount", "LeapYearQ", "LeastSquares",%
3259    "LeastSquaresFilterKernel", "Left", "LeftArrow", "LeftArrowBar",%
3260    "LeftArrowRightArrow", "LeftDownTeeVector", "LeftDownVector",%
3261    "LeftDownVectorBar", "LeftRightArrow", "LeftRightVector", "LeftTee",%
3262    "LeftTeeArrow", "LeftTeeVector", "LeftTriangle", "LeftTriangleBar",%
3263    "LeftTriangleEqual", "LeftUpDownVector", "LeftUpTeeVector",%
3264    "LeftUpVector", "LeftUpVectorBar", "LeftVector", "LeftVectorBar",%
3265    "LegendAppearance", "Legended", "LegendFunction", "LegendLabel",%
3266    "LegendLayout", "LegendMargins", "LegendMarkers", "LegendMarkerSize",%
3267    "LegendreP", "LegendreQ", "LegendreType", "Length", "LengthWhile",%
3268    "LerchPhi", "Less", "LessEqual", "LessEqualGreater", "LessEqualThan",%
3269    "LessFullEqual", "LessGreater", "LessLess", "LessSlantEqual",%
3270    "LessThan", "LessTilde", "LetterCharacter", "LetterCounts",%
3271    "LetterNumber", "LetterQ", "Level", "LeveneTest", "LeviCivitaTensor",%
3272    "LevyDistribution", "Lexicographic", "LibraryDataType",%
3273    "LibraryFunction", "LibraryFunctionError",%
3274    "LibraryFunctionInformation", "LibraryFunctionLoad",%
3275    "LibraryFunctionUnload", "LibraryLoad", "LibraryUnload", "LicenseID",%
3276    "LiftingFilterData", "LiftingWaveletTransform", "LightBlue",%
3277    "LightBrown", "LightCyan", "Lighter", "LightGray", "LightGreen",%
3278    "Lighting", "LightingAngle", "LightMagenta", "LightOrange",%
3279    "LightPink", "LightPurple", "LightRed", "LightSources",%
3280    "LightYellow", "Likelihood", "Limit", "LimitsPositioning",%
3281    "LimitsPositioningTokens", "LindleyDistribution", "Line",%
3282    "Line3DBox", "Line3DBoxOptions", "LinearFilter",%
3283    "LinearFractionalTransform", "LinearGradientImage",%
3284    "LinearizingTransformationData", "LinearModelFit",%
3285    "LinearOffsetFunction", "LinearProgramming", "LinearRecurrence",%
3286    "LinearSolve", "LinearSolveFunction", "LineBox", "LineBoxOptions",%
3287    "LineBreak", "LinebreakAdjustments", "LineBreakChart",%
3288    "LinebreakSemicolonWeighting", "LineBreakWithin", "LineColor",%
3289    "LineGraph", "LineIndent", "LineIndentMaxFraction",%
3290    "LineIntegralConvolutionPlot", "LineIntegralConvolutionScale",%
3291    "LineLegend", "LineOpacity", "LineSpacing", "LineWrapParts",%
3292    "LinkActivate", "LinkClose", "LinkConnect", "LinkConnectedQ",%
3293    "LinkCreate", "LinkError", "LinkFlush", "LinkFunction", "LinkHost",%
3294    "LinkInterrupt", "LinkLaunch", "LinkMode", "LinkObject", "LinkOpen",%
3295    "LinkOptions", "LinkPatterns", "LinkProtocol", "LinkRankCentrality",%
3296    "LinkRead", "LinkReadHeld", "LinkReadyQ", "Links", "LinkService",%
3297    "LinkWrite", "LinkWriteHeld", "LiouvilleLambda", "List", "Listable",%
3298    "ListAnimate", "ListContourPlot", "ListContourPlot3D",%
3299    "ListConvolve", "ListCorrelate", "ListCurvePathPlot",%
3300    "ListDeconvolve", "ListDensityPlot", "ListDensityPlot3D", "Listen",%
3301    "ListFormat", "ListFourierSequenceTransform", "ListInterpolation",%
3302    "ListLineIntegralConvolutionPlot", "ListLinePlot",%
3303    "ListLogLinearPlot", "ListLogLogPlot", "ListLogPlot", "ListPicker",%
3304    "ListPickerBox", "ListPickerBoxBackground", "ListPickerBoxOptions",%
3305    "ListPlay", "ListPlot", "ListPlot3D", "ListPointPlot3D",%
```

```
3306    "ListPolarPlot", "ListQ", "ListSliceContourPlot3D",%
3307    "ListSliceDensityPlot3D", "ListSliceVectorPlot3D", "ListStepPlot",%
3308    "ListStreamDensityPlot", "ListStreamPlot", "ListSurfacePlot3D",%
3309    "ListVectorDensityPlot", "ListVectorPlot", "ListVectorPlot3D",%
3310    "ListZTransform", "Literal", "LiteralSearch",%
3311    "LocalAdaptiveBinarize", "LocalCache", "LocalClusteringCoefficient",%
3312    "LocalizeDefinitions", "LocalizeVariables", "LocalObject",%
3313    "LocalObjects", "LocalSymbol", "LocalTime", "LocalTimeZone",%
3314    "LocationEquivalenceTest", "LocationTest", "Locator",%
3315    "LocatorAutoCreate", "LocatorBox", "LocatorBoxOptions",%
3316    "LocatorCentering", "LocatorPane", "LocatorPaneBox",%
3317    "LocatorPaneBoxOptions", "LocatorRegion", "Locked", "Log", "Log10",%
3318    "Log2", "LogBarnesG", "LogGamma", "LogGammaDistribution",%
3319    "LogicalExpand", "LogIntegral", "LogisticDistribution",%
3320    "LogisticSigmoid", "LogitModelFit", "LogLikelihood", "LogLinearPlot",%
3321    "LogLogisticDistribution", "LogLogPlot",%
3322    "LogMultinormalDistribution", "LogNormalDistribution", "LogPlot",%
3323    "LogRankTest", "LogSeriesDistribution", "LongEqual", "Longest",%
3324    "LongestCommonSequence", "LongestCommonSequencePositions",%
3325    "LongestCommonSubsequence", "LongestCommonSubsequencePositions",%
3326    "LongestMatch", "LongestOrderedSequence", "LongForm", "Longitude",%
3327    "LongLeftArrow", "LongLeftRightArrow", "LongRightArrow", "Lookup",%
3328    "Loopback", "LoopFreeGraphQ", "LowerCaseQ", "LowerLeftArrow",%
3329    "LowerRightArrow", "LowerTriangularize", "LowpassFilter",%
3330    "LQEstimatorGains", "LQGRegulator", "LQOutputRegulatorGains",%
3331    "LQRegulatorGains", "LUBackSubstitution", "LucasL",%
3332    "LuccioSamiComponents", "LUDecomposition", "LunarEclipse",%
3333    "LUVColor", "LyapunovSolve", "LyonsGroupLy", "MachineID",%
3334    "MachineName", "MachineNumberQ", "MachinePrecision",%
3335    "MacintoshSystemPageSetup", "Magenta", "Magnification", "Magnify",%
3336    "MailReceiverFunction", "MailResponseFunction", "MainSolve",%
3337    "MaintainDynamicCaches", "Majority", "MakeBoxes", "MakeExpression",%
3338    "MakeRules", "ManagedLibraryExpressionID",%
3339    "ManagedLibraryExpressionQ", "MandelbrotSetBoettcher",%
3340    "MandelbrotSetDistance", "MandelbrotSetIterationCount",%
3341    "MandelbrotSetMemberQ", "MandelbrotSetPlot", "MangoldtLambda",%
3342    "ManhattanDistance", "Manipulate", "Manipulator",%
3343    "MannedSpaceMissionData", "MannWhitneyTest", "MantissaExponent",%
3344    "Manual", "Map", "MapAll", "MapAt", "MapIndexed", "MAProcess",%
3345    "MapThread", "MarchenkoPasturDistribution", "MarcumQ",%
3346    "MardiaCombinedTest", "MardiaKurtosisTest", "MardiaSkewnessTest",%
3347    "MarginalDistribution", "MarkovProcessProperties", "Masking",%
3348    "MatchingDissimilarity", "MatchLocalNameQ", "MatchLocalNames",%
3349    "MatchQ", "Material", "MathematicalFunctionData",%
3350    "MathematicaNotation", "MathieuC", "MathieuCharacteristicA",%
3351    "MathieuCharacteristicB", "MathieuCharacteristicExponent",%
3352    "MathieuCPrime", "MathieuGroupM11", "MathieuGroupM12",%
3353    "MathieuGroupM22", "MathieuGroupM23", "MathieuGroupM24", "MathieuS",%
3354    "MathieuSPrime", "MathMLForm", "MathMLText", "Matrices", "MatrixExp",%
3355    "MatrixForm", "MatrixFunction", "MatrixLog",%
3356    "MatrixNormalDistribution", "MatrixPlot", "MatrixPower",%
3357    "MatrixPropertyDistribution", "MatrixQ", "MatrixRank",%
3358    "MatrixTDistribution", "Max", "MaxBend", "MaxCellMeasure",%
3359    "MaxDetect", "MaxExtraBandwidths", "MaxExtraConditions",%
```

```
3360    "MaxFeatureDisplacement", "MaxFeatures", "MaxFilter", "MaximalBy",%
3361    "Maximize", "MaxItems", "MaxIterations", "MaxMemoryUsed",%
3362    "MaxMixtureKernels", "MaxPlotPoints", "MaxPoints", "MaxRecursion",%
3363    "MaxStableDistribution", "MaxStepFraction", "MaxSteps",%
3364    "MaxStepSize", "MaxTrainingRounds", "MaxValue",%
3365    "MaxwellDistribution", "MaxWordGap", "McLaughlinGroupMcL", "Mean",%
3366    "MeanAbsoluteLossLayer", "MeanClusteringCoefficient",%
3367    "MeanDegreeConnectivity", "MeanDeviation", "MeanFilter",%
3368    "MeanGraphDistance", "MeanNeighborDegree", "MeanShift",%
3369    "MeanShiftFilter", "MeanSquaredLossLayer", "Median",%
3370    "MedianDeviation", "MedianFilter", "MedicalTestData", "Medium",%
3371    "MeijerG", "MeijerGReduce", "MeixnerDistribution", "MellinConvolve",%
3372    "MellinTransform", "MemberQ", "MemoryConstrained",%
3373    "MemoryConstraint", "MemoryInUse", "Menu", "MenuAppearance",%
3374    "MenuCommandKey", "MenuEvaluator", "MenuItem", "MenuPacket",%
3375    "MenuSortingValue", "MenuStyle", "MenuView", "Merge",%
3376    "MergeDifferences", "MersennePrimeExponent",%
3377    "MersennePrimeExponentQ", "Mesh", "MeshCellCentroid",%
3378    "MeshCellCount", "MeshCellHighlight", "MeshCellIndex",%
3379    "MeshCellLabel", "MeshCellMarker", "MeshCellMeasure",%
3380    "MeshCellQuality", "MeshCells", "MeshCellShapeFunction",%
3381    "MeshCellStyle", "MeshCoordinates", "MeshFunctions",%
3382    "MeshPrimitives", "MeshQualityGoal", "MeshRange",%
3383    "MeshRefinementFunction", "MeshRegion", "MeshRegionQ", "MeshShading",%
3384    "MeshStyle", "Message", "MessageDialog", "MessageList",%
3385    "MessageName", "MessageOptions", "MessagePacket", "Messages",%
3386    "MessagesNotebook", "MetaCharacters", "MetaInformation",%
3387    "MetaParameters", "MeteorShowerData", "Method", "MethodOptions",%
3388    "MexicanHatWavelet", "MeyerWavelet", "Min", "MinColorDistance",%
3389    "MinDetect", "MineralData", "MinFilter", "MinimalBy",%
3390    "MinimalPolynomial", "MinimalStateSpaceModel", "Minimize",%
3391    "MinimumTimeIncrement", "MinIntervalSize", "MinkowskiQuestionMark",%
3392    "MinMax", "MinorPlanetData", "Minors", "MinRecursion", "MinSize",%
3393    "MinStableDistribution", "Minus", "MinusPlus", "MinValue", "Missing",%
3394    "MissingBehavior", "MissingDataMethod", "MissingDataRules",%
3395    "MissingQ", "MissingString", "MissingStyle", "MittagLefflerE",%
3396    "MixedGraphQ", "MixedMagnitude", "MixedRadix", "MixedRadixQuantity",%
3397    "MixedUnit", "MixtureDistribution", "Mod", "Modal", "Mode",%
3398    "Modular", "ModularLambda", "Module", "Modulus", "MoebiusMu",%
3399    "Moment", "Momentary", "MomentConvert", "MomentEvaluate",%
3400    "MomentGeneratingFunction", "MomentOfInertia", "Monday", "Monitor",%
3401    "MonomialList", "MonomialOrder", "MonsterGroupM", "MoonPhase",%
3402    "MoonPosition", "MorletWavelet", "MorphologicalBinarize",%
3403    "MorphologicalBranchPoints", "MorphologicalComponents",%
3404    "MorphologicalEulerNumber", "MorphologicalGraph",%
3405    "MorphologicalPerimeter", "MorphologicalTransform", "MortalityData",%
3406    "Most", "MountainData", "MouseAnnotation", "MouseAppearance",%
3407    "MouseAppearanceTag", "MouseButtons", "Mouseover",%
3408    "MousePointerNote", "MousePosition", "MovieData", "MovingAverage",%
3409    "MovingMap", "MovingMedian", "MoyalDistribution", "Multicolumn",%
3410    "MultiedgeStyle", "MultigraphQ", "MultilaunchWarning",%
3411    "MultiLetterItalics", "MultiLetterStyle", "MultilineFunction",%
3412    "Multinomial", "MultinomialDistribution", "MultinormalDistribution",%
3413    "MultiplicativeOrder", "Multiplicity", "Multiselection",%
```

```
3414      "MultivariateHypergeometricDistribution",%
3415      "MultivariatePoissonDistribution", "MultivariateTDistribution", "N",%
3416      "NakagamiDistribution", "NameQ", "Names", "NamespaceBox", "Nand",%
3417      "NArgMax", "NArgMin", "NBernoulliB", "NCache", "NDEigensystem",%
3418      "NDEigenvalues", "NDSolve", "NDSolveValue", "Nearest",%
3419      "NearestFunction", "NearestNeighborGraph", "NebulaData",%
3420      "NeedCurrentFrontEndPackagePacket",%
3421      "NeedCurrentFrontEndSymbolsPacket", "NeedlemanWunschSimilarity",%
3422      "Needs", "Negative", "NegativeBinomialDistribution",%
3423      "NegativeDefiniteMatrixQ", "NegativeMultinomialDistribution",%
3424      "NegativeSemidefiniteMatrixQ", "NeighborhoodData",%
3425      "NeighborhoodGraph", "Nest", "NestedGreaterGreater",%
3426      "NestedLessLess", "NestedScriptRules", "NestGraph", "NestList",%
3427      "NestWhile", "NestWhileList", "NetChain", "NetDecoder", "NetEncoder",%
3428      "NetExtract", "NetGraph", "NetInitialize", "NetPort", "NetTrain",%
3429      "NeumannValue", "NevilleThetaC", "NevilleThetaD", "NevilleThetaN",%
3430      "NevilleThetaS", "NewPrimitiveStyle", "NExpectation", "Next",%
3431      "NextCell", "NextPrime", "NextScheduledTaskTime", "NHoldAll",%
3432      "NHoldFirst", "NHoldRest", "NicholsGridLines", "NicholsPlot",%
3433      "NightHemisphere", "NIntegrate", "NMaximize", "NMaxValue",%
3434      "NMinimize", "NMinValue", "NominalVariables", "NonAssociative",%
3435      "NoncentralBetaDistribution", "NoncentralChiSquareDistribution",%
3436      "NoncentralFRatioDistribution", "NoncentralStudentTDistribution",%
3437      "NonCommutativeMultiply", "NonConstants", "None", "NoneTrue",%
3438      "NonlinearModelFit", "NonlinearStateSpaceModel",%
3439      "NonlocalMeansFilter", "NonNegative", "NonPositive", "Nor",%
3440      "NorlundB", "Norm", "Normal", "NormalDistribution", "NormalGrouping",%
3441      "Normalize", "Normalized", "NormalizedSquaredEuclideanDistance",%
3442      "NormalMatrixQ", "NormalsFunction", "NormFunction", "Not",%
3443      "NotCongruent", "NotCupCap", "NotDoubleVerticalBar", "Notebook",%
3444      "NotebookApply", "NotebookAutoSave", "NotebookClose",%
3445      "NotebookConvertSettings", "NotebookCreate",%
3446      "NotebookCreateReturnObject", "NotebookDefault", "NotebookDelete",%
3447      "NotebookDirectory", "NotebookDynamicExpression", "NotebookEvaluate",%
3448      "NotebookEventActions", "NotebookFileName", "NotebookFind",%
3449      "NotebookFindReturnObject", "NotebookGet",%
3450      "NotebookGetLayoutInformationPacket",%
3451      "NotebookGetMisspellingsPacket", "NotebookImport",%
3452      "NotebookInformation", "NotebookInterfaceObject", "NotebookLocate",%
3453      "NotebookObject", "NotebookOpen", "NotebookOpenReturnObject",%
3454      "NotebookPath", "NotebookPrint", "NotebookPut",%
3455      "NotebookPutReturnObject", "NotebookRead",%
3456      "NotebookResetGeneratedCells", "Notebooks", "NotebookSave",%
3457      "NotebookSaveAs", "NotebookSelection",%
3458      "NotebookSetupLayoutInformationPacket", "NotebooksMenu",%
3459      "NotebookTemplate", "NotebookWrite", "NotElement", "NotEqualTilde",%
3460      "NotExists", "NotGreater", "NotGreaterEqual", "NotGreaterFullEqual",%
3461      "NotGreaterGreater", "NotGreaterLess", "NotGreaterSlantEqual",%
3462      "NotGreaterTilde", "Nothing", "NotHumpDownHump", "NotHumpEqual",%
3463      "NotificationFunction", "NotLeftTriangle", "NotLeftTriangleBar",%
3464      "NotLeftTriangleEqual", "NotLess", "NotLessEqual",%
3465      "NotLessFullEqual", "NotLessGreater", "NotLessLess",%
3466      "NotLessSlantEqual", "NotLessTilde", "NotNestedGreaterGreater",%
3467      "NotNestedLessLess", "NotPrecedes", "NotPrecedesEqual",%
```

```
3468    "NotPrecedesSlantEqual", "NotPrecedesTilde", "NotReverseElement",%
3469    "NotRightTriangle", "NotRightTriangleBar", "NotRightTriangleEqual",%
3470    "NotSquareSubset", "NotSquareSubsetEqual", "NotSquareSuperset",%
3471    "NotSquareSupersetEqual", "NotSubset", "NotSubsetEqual",%
3472    "NotSucceeds", "NotSucceedsEqual", "NotSucceedsSlantEqual",%
3473    "NotSucceedsTilde", "NotSuperset", "NotSupersetEqual", "NotTilde",%
3474    "NotTildeEqual", "NotTildeFullEqual", "NotTildeTilde",%
3475    "NotVerticalBar", "Now", "NoWhitespace", "NProbability", "NProduct",%
3476    "NProductFactors", "NRoots", "NSolve", "NSum", "NSumTerms",%
3477    "NuclearExplosionData", "NuclearReactorData", "Null", "NullRecords",%
3478    "NullSpace", "NullWords", "Number", "NumberCompose",%
3479    "NumberDecompose", "NumberExpand", "NumberFieldClassNumber",%
3480    "NumberFieldDiscriminant", "NumberFieldFundamentalUnits",%
3481    "NumberFieldIntegralBasis", "NumberFieldNormRepresentatives",%
3482    "NumberFieldRegulator", "NumberFieldRootsOfUnity",%
3483    "NumberFieldSignature", "NumberForm", "NumberFormat",%
3484    "NumberLinePlot", "NumberMarks", "NumberMultiplier", "NumberPadding",%
3485    "NumberPoint", "NumberQ", "NumberSeparator", "NumberSigns",%
3486    "NumberString", "Numerator", "NumericFunction", "NumericQ",%
3487    "NuttallWindow", "NValues", "NyquistGridLines", "NyquistPlot", "O",%
3488    "ObservabilityGramian", "ObservabilityMatrix",%
3489    "ObservableDecomposition", "ObservableModelQ", "OceanData", "OddQ",%
3490    "Off", "Offset", "OLEData", "On", "ONanGroupON", "Once",%
3491    "OneIdentity", "Opacity", "OpacityFunction",%
3492    "OpacityFunctionScaling", "Open", "OpenAppend", "Opener",%
3493    "OpenerBox", "OpenerBoxOptions", "OpenerView",%
3494    "OpenFunctionInspectorPacket", "Opening", "OpenRead",%
3495    "OpenSpecialOptions", "OpenTemporary", "OpenWrite", "Operate",%
3496    "OperatingSystem", "OptimumFlowData", "Optional", "OptionalElement",%
3497    "OptionInspectorSettings", "OptionQ", "Options", "OptionsPacket",%
3498    "OptionsPattern", "OptionValue", "OptionValueBox",%
3499    "OptionValueBoxOptions", "Or", "Orange", "Order",%
3500    "OrderDistribution", "OrderedQ", "Ordering", "Orderless",%
3501    "OrderlessPatternSequence", "OrnsteinUhlenbeckProcess",%
3502    "Orthogonalize", "OrthogonalMatrixQ", "Out", "Outer",%
3503    "OutputAutoOverwrite", "OutputControllabilityMatrix",%
3504    "OutputControllableModelQ", "OutputForm", "OutputFormData",%
3505    "OutputGrouping", "OutputMathEditExpression", "OutputNamePacket",%
3506    "OutputResponse", "OutputSizeLimit", "OutputStream", "Over",%
3507    "OverBar", "OverDot", "Overflow", "OverHat", "Overlaps", "Overlay",%
3508    "OverlayBox", "OverlayBoxOptions", "Overscript", "OverscriptBox",%
3509    "OverscriptBoxOptions", "OverTilde", "OverVector", "OverwriteTarget",%
3510    "OwenT", "OwnValues", "Package", "PackingMethod", "PaddedForm",%
3511    "Padding", "PaddingSize", "PadeApproximant", "PadLeft", "PadRight",%
3512    "PageBreakAbove", "PageBreakBelow", "PageBreakWithin",%
3513    "PageFooterLines", "PageFooters", "PageHeaderLines", "PageHeaders",%
3514    "PageHeight", "PageRankCentrality", "PageTheme", "PageWidth",%
3515    "Pagination", "PairedBarChart", "PairedHistogram",%
3516    "PairedSmoothHistogram", "PairedTTest", "PairedZTest",%
3517    "PaletteNotebook", "PalettePath", "PalindromeQ", "Pane", "PaneBox",%
3518    "PaneBoxOptions", "Panel", "PanelBox", "PanelBoxOptions", "Paneled",%
3519    "PaneSelector", "PaneSelectorBox", "PaneSelectorBoxOptions",%
3520    "PaperWidth", "ParabolicCylinderD", "ParagraphIndent",%
3521    "ParagraphSpacing", "ParallelArray", "ParallelCombine", "ParallelDo",%
```

```
3522    "Parallelepiped", "ParallelEvaluate", "Parallelization",%
3523    "Parallelize", "ParallelMap", "ParallelNeeds", "Parallelogram",%
3524    "ParallelProduct", "ParallelSubmit", "ParallelSum", "ParallelTable",%
3525    "ParallelTry", "Parameter", "ParameterEstimator",%
3526    "ParameterMixtureDistribution", "ParameterVariables",%
3527    "ParametricFunction", "ParametricNDSolve", "ParametricNDSolveValue",%
3528    "ParametricPlot", "ParametricPlot3D", "ParametricRegion",%
3529    "ParentBox", "ParentCell", "ParentConnect", "ParentDirectory",%
3530    "ParentForm", "Parenthesize", "ParentList", "ParentNotebook",%
3531    "ParetoDistribution", "ParkData", "Part", "PartBehavior",%
3532    "PartialCorrelationFunction", "PartialD", "ParticleAcceleratorData",%
3533    "ParticleData", "Partition", "PartitionGranularity", "PartitionsP",%
3534    "PartitionsQ", "PartOfSpeech", "PartProtection", "ParzenWindow",%
3535    "PascalDistribution", "PassEventsDown", "PassEventsUp", "Paste",%
3536    "PasteBoxFormInlineCells", "PasteButton", "Path", "PathGraph",%
3537    "PathGraphQ", "Pattern", "PatternSequence", "PatternTest",%
3538    "PauliMatrix", "PaulWavelet", "Pause", "PausedTime", "PDF",%
3539    "PeakDetect", "PearsonChiSquareTest", "PearsonCorrelationTest",%
3540    "PearsonDistribution", "PerfectNumber", "PerfectNumberQ",%
3541    "PerformanceGoal", "PeriodicBoundaryCondition",%
3542    "PeriodicInterpolation", "Periodogram", "PeriodogramArray",%
3543    "Permanent", "Permissions", "PermissionsGroup", "PermissionsGroups",%
3544    "PermissionsKey", "PermissionsKeys", "PermutationCycles",%
3545    "PermutationCyclesQ", "PermutationGroup", "PermutationLength",%
3546    "PermutationList", "PermutationListQ", "PermutationMax",%
3547    "PermutationMin", "PermutationOrder", "PermutationPower",%
3548    "PermutationProduct", "PermutationReplace", "Permutations",%
3549    "PermutationSupport", "Permute", "PeronaMalikFilter",%
3550    "Perpendicular", "PersonData", "PERTDistribution", "PetersenGraph",%
3551    "PhaseMargins", "PhaseRange", "PhysicalSystemData", "Pi", "Pick",%
3552    "PIDData", "PIDDerivativeFilter", "PIDFeedforward", "PIDTune",%
3553    "Piecewise", "PiecewiseExpand", "PieChart", "PieChart3D",%
3554    "PillaiTrace", "PillaiTraceTest", "PingTime", "Pink", "Pivoting",%
3555    "PixelConstrained", "PixelValue", "PixelValuePositions", "Placed",%
3556    "Placeholder", "PlaceholderReplace", "Plain", "PlanarGraph",%
3557    "PlanarGraphQ", "PlanckRadiationLaw", "PlaneCurveData",%
3558    "PlanetaryMoonData", "PlanetData", "PlantData", "Play", "PlayRange",%
3559    "Plot", "Plot3D", "Plot3Matrix", "PlotDivision", "PlotJoined",%
3560    "PlotLabel", "PlotLabels", "PlotLayout", "PlotLegends",%
3561    "PlotMarkers", "PlotPoints", "PlotRange", "PlotRangeClipping",%
3562    "PlotRangeClipPlanesStyle", "PlotRangePadding", "PlotRegion",%
3563    "PlotStyle", "PlotTheme", "Pluralize", "Plus", "PlusMinus",%
3564    "Pochhammer", "PodStates", "PodWidth", "Point", "Point3DBox",%
3565    "Point3DBoxOptions", "PointBox", "PointBoxOptions",%
3566    "PointFigureChart", "PointLegend", "PointSize",%
3567    "PoissonConsulDistribution", "PoissonDistribution", "PoissonProcess",%
3568    "PoissonWindow", "PolarAxes", "PolarAxesOrigin", "PolarGridLines",%
3569    "PolarPlot", "PolarTicks", "PoleZeroMarkers",%
3570    "PolyaAeppliDistribution", "PolyGamma", "Polygon", "Polygon3DBox",%
3571    "Polygon3DBoxOptions", "PolygonalNumber", "PolygonBox",%
3572    "PolygonBoxOptions", "PolygonHoleScale", "PolygonIntersections",%
3573    "PolygonScale", "PolyhedronData", "PolyLog", "PolynomialExtendedGCD",%
3574    "PolynomialForm", "PolynomialGCD", "PolynomialLCM", "PolynomialMod",%
3575    "PolynomialQ", "PolynomialQuotient", "PolynomialQuotientRemainder",%
```

```
3576    "PolynomialReduce", "PolynomialRemainder", "Polynomials",%
3577    "PoolingLayer", "PopupMenu", "PopupMenuBox", "PopupMenuBoxOptions",%
3578    "PopupView", "PopupWindow", "Position", "PositionIndex", "Positive",%
3579    "PositiveDefiniteMatrixQ", "PositiveSemidefiniteMatrixQ",%
3580    "PossibleZeroQ", "Postfix", "PostScript", "Power",%
3581    "PowerDistribution", "PowerExpand", "PowerMod", "PowerModList",%
3582    "PowerRange", "PowerSpectralDensity", "PowersRepresentations",%
3583    "PowerSymmetricPolynomial", "Precedence", "PrecedenceForm",%
3584    "Precedes", "PrecedesEqual", "PrecedesSlantEqual", "PrecedesTilde",%
3585    "Precision", "PrecisionGoal", "PreDecrement", "Predict",%
3586    "PredictionRoot", "PredictorFunction", "PredictorInformation",%
3587    "PredictorMeasurements", "PredictorMeasurementsObject",%
3588    "PreemptProtect", "PreferencesPath", "Prefix", "PreIncrement",%
3589    "Prepend", "PrependTo", "PreserveImageOptions", "Previous",%
3590    "PreviousCell", "PriceGraphDistribution", "PrimaryPlaceholder",%
3591    "Prime", "PrimeNu", "PrimeOmega", "PrimePi", "PrimePowerQ", "PrimeQ",%
3592    "Primes", "PrimeZetaP", "PrimitiveRoot", "PrimitiveRootList",%
3593    "PrincipalComponents", "PrincipalValue", "Print", "PrintableASCIIQ",%
3594    "PrintAction", "PrintForm", "PrintingCopies", "PrintingOptions",%
3595    "PrintingPageRange", "PrintingStartingPageNumber",%
3596    "PrintingStyleEnvironment", "Printout3D", "Printout3DPreviewer",%
3597    "PrintPrecision", "PrintTemporary", "Prism", "PrismBox",%
3598    "PrismBoxOptions", "PrivateCellOptions", "PrivateEvaluationOptions",%
3599    "PrivateFontOptions", "PrivateFrontEndOptions", "PrivateKey",%
3600    "PrivateNotebookOptions", "PrivatePaths", "Probability",%
3601    "ProbabilityDistribution", "ProbabilityPlot", "ProbabilityPr",%
3602    "ProbabilityScalePlot", "ProbitModelFit", "ProcessConnection",%
3603    "ProcessDirectory", "ProcessEnvironment", "Processes",%
3604    "ProcessEstimator", "ProcessInformation", "ProcessObject",%
3605    "ProcessParameterAssumptions", "ProcessParameterQ",%
3606    "ProcessStateDomain", "ProcessStatus", "ProcessTimeDomain",%
3607    "Product", "ProductDistribution", "ProductLog", "ProgressIndicator",%
3608    "ProgressIndicatorBox", "ProgressIndicatorBoxOptions", "Projection",%
3609    "Prolog", "PromptForm", "Properties", "Property", "PropertyList",%
3610    "PropertyValue", "Proportion", "Proportional", "Protect",%
3611    "Protected", "ProteinData", "Pruning", "PseudoInverse", "PublicKey",%
3612    "PulsarData", "PunctuationCharacter", "Purple", "Put", "PutAppend",%
3613    "Pyramid", "PyramidBox", "PyramidBoxOptions", "QBinomial",%
3614    "QFactorial", "QGamma", "QHypergeometricPFQ", "QPochhammer",%
3615    "QPolyGamma", "QRDecomposition", "QuadraticIrrationalQ", "Quantile",%
3616    "QuantilePlot", "Quantity", "QuantityArray", "QuantityDistribution",%
3617    "QuantityForm", "QuantityMagnitude", "QuantityQ", "QuantityThread",%
3618    "QuantityUnit", "QuantityVariable", "QuantityVariableCanonicalUnit",%
3619    "QuantityVariableDimensions", "QuantityVariableIdentifier",%
3620    "QuantityVariablePhysicalQuantity", "Quartics", "QuartileDeviation",%
3621    "Quartiles", "QuartileSkewness", "Query", "QueueingNetworkProcess",%
3622    "QueueingProcess", "QueueProperties", "Quiet", "Quit", "Quotient",%
3623    "QuotientRemainder", "RadialGradientImage", "RadialityCentrality",%
3624    "RadicalBox", "RadicalBoxOptions", "RadioButton", "RadioButtonBar",%
3625    "RadioButtonBox", "RadioButtonBoxOptions", "Radon", "RamanujanTau",%
3626    "RamanujanTauL", "RamanujanTauTheta", "RamanujanTauZ", "Ramp",%
3627    "Random", "RandomChoice", "RandomColor", "RandomComplex",%
3628    "RandomEntity", "RandomFunction", "RandomGraph", "RandomImage",%
3629    "RandomInteger", "RandomPermutation", "RandomPoint", "RandomPrime",%
```

```
3630        "RandomReal", "RandomSample", "RandomSeed", "RandomVariate",%
3631        "RandomWalkProcess", "RandomWord", "Range", "RangeFilter",%
3632        "RangeSpecification", "RankedMax", "RankedMin", "Raster", "Raster3D",%
3633        "Raster3DBox", "Raster3DBoxOptions", "RasterArray", "RasterBox",%
3634        "RasterBoxOptions", "Rasterize", "RasterSize", "Rational",%
3635        "RationalFunctions", "Rationalize", "Rationals", "Ratios", "Raw",%
3636        "RawArray", "RawBoxes", "RawData", "RawMedium",%
3637        "RayleighDistribution", "Re", "Read", "ReadLine", "ReadList",%
3638        "ReadProtected", "ReadString", "Real", "RealBlockDiagonalForm",%
3639        "RealDigits", "RealExponent", "Reals", "Reap", "RecognitionPrior",%
3640        "RecognitionThreshold", "Record", "RecordLists", "RecordSeparators",%
3641        "Rectangle", "RectangleBox", "RectangleBoxOptions", "RectangleChart",%
3642        "RectangleChart3D", "RecurrenceFilter", "RecurrenceTable",%
3643        "RecurringDigitsForm", "Red", "Reduce", "RefBox",%
3644        "ReferenceLineStyle", "ReferenceMarkers", "ReferenceMarkerStyle",%
3645        "Refine", "ReflectionMatrix", "ReflectionTransform", "Refresh",%
3646        "RefreshRate", "RegionBinarize", "RegionBoundary", "RegionBounds",%
3647        "RegionCentroid", "RegionDifference", "RegionDimension",%
3648        "RegionDistance", "RegionDistanceFunction",%
3649        "RegionEmbeddingDimension", "RegionFunction", "RegionIntersection",%
3650        "RegionMeasure", "RegionMember", "RegionMemberFunction",%
3651        "RegionMoment", "RegionNearest", "RegionNearestFunction",%
3652        "RegionPlot", "RegionPlot3D", "RegionProduct", "RegionQ",%
3653        "RegionResize", "RegionSize", "RegionSymmetricDifference",%
3654        "RegionUnion", "RegularExpression", "Regularization",%
3655        "RegularlySampledQ", "RegularPolygon", "ReIm", "Reinstall",%
3656        "RelationGraph", "Release", "ReleaseHold", "ReliabilityDistribution",%
3657        "ReliefImage", "ReliefPlot", "Remove", "RemoveAlphaChannel",%
3658        "RemoveAsynchronousTask", "RemoveBackground",%
3659        "RemoveChannelListener", "Removed", "RemoveDiacritics",%
3660        "RemoveInputStreamMethod", "RemoveOutputStreamMethod",%
3661        "RemoveProperty", "RemoveScheduledTask", "RemoveUsers",%
3662        "RenameDirectory", "RenameFile", "RenderAll", "RenderingOptions",%
3663        "RenewalProcess", "RenkoChart", "RepairMesh", "Repeated",%
3664        "RepeatedNull", "RepeatedString", "RepeatedTiming",%
3665        "RepeatingElement", "Replace", "ReplaceAll", "ReplaceHeldPart",%
3666        "ReplaceImageValue", "ReplaceList", "ReplacePart",%
3667        "ReplacePixelValue", "ReplaceRepeated", "RequiredPhysicalQuantities",%
3668        "Resampling", "ResamplingAlgorithmData", "ResamplingMethod",%
3669        "Rescale", "RescalingTransform", "ResetDirectory",%
3670        "ResetMenusPacket", "ResetScheduledTask", "ReshapeLayer", "Residue",%
3671        "Resolve", "ResourceAcquire", "ResourceData", "ResourceObject",%
3672        "ResourceRemove", "ResourceSearch", "ResourceSubmissionObject",%
3673        "ResourceSubmit", "ResponseForm", "Rest", "RestartInterval",%
3674        "Restricted", "Resultant", "ResumePacket", "Return",%
3675        "ReturnExpressionPacket", "ReturnInputFormPacket", "ReturnPacket",%
3676        "ReturnReceiptFunction", "ReturnTextPacket", "Reverse",%
3677        "ReverseBiorthogonalSplineWavelet", "ReverseElement",%
3678        "ReverseEquilibrium", "ReverseGraph", "ReverseUpEquilibrium",%
3679        "RevolutionAxis", "RevolutionPlot3D", "RGBColor", "RiccatiSolve",%
3680        "RiceDistribution", "RidgeFilter", "RiemannR", "RiemannSiegelTheta",%
3681        "RiemannSiegelZ", "RiemannXi", "Riffle", "Right", "RightArrow",%
3682        "RightArrowBar", "RightArrowLeftArrow", "RightComposition",%
3683        "RightCosetRepresentative", "RightDownTeeVector", "RightDownVector",%
```

```
3684    "RightDownVectorBar", "RightTee", "RightTeeArrow", "RightTeeVector",%
3685    "RightTriangle", "RightTriangleBar", "RightTriangleEqual",%
3686    "RightUpDownVector", "RightUpTeeVector", "RightUpVector",%
3687    "RightUpVectorBar", "RightVector", "RightVectorBar",%
3688    "RiskAchievementImportance", "RiskReductionImportance",%
3689    "RogersTanimotoDissimilarity", "RollPitchYawAngles",%
3690    "RollPitchYawMatrix", "RomanNumeral", "Root", "RootApproximant",%
3691    "RootIntervals", "RootLocusPlot", "RootMeanSquare", "RootOfUnityQ",%
3692    "RootReduce", "Roots", "RootSum", "Rotate", "RotateLabel",%
3693    "RotateLeft", "RotateRight", "RotationAction", "RotationBox",%
3694    "RotationBoxOptions", "RotationMatrix", "RotationTransform", "Round",%
3695    "RoundImplies", "RoundingRadius", "Row", "RowAlignments",%
3696    "RowBackgrounds", "RowBox", "RowHeights", "RowLines", "RowMinHeight",%
3697    "RowReduce", "RowsEqual", "RowSpacings", "RSolve", "RSolveValue",%
3698    "RudinShapiro", "RudvalisGroupRu", "Rule", "RuleCondition",%
3699    "RuleDelayed", "RuleForm", "RulePlot", "RulerUnits", "Run",%
3700    "RunProcess", "RunScheduledTask", "RunThrough", "RuntimeAttributes",%
3701    "RuntimeOptions", "RussellRaoDissimilarity", "SameQ", "SameTest",%
3702    "SampleDepth", "SampledSoundFunction", "SampledSoundList",%
3703    "SampleRate", "SamplingPeriod", "SARIMAProcess", "SARMAProcess",%
3704    "SASTriangle", "SatelliteData", "SatisfiabilityCount",%
3705    "SatisfiabilityInstances", "SatisfiableQ", "Saturday", "Save",%
3706    "Saveable", "SaveAutoDelete", "SaveDefinitions",%
3707    "SavitzkyGolayMatrix", "SawtoothWave", "Scale", "Scaled",%
3708    "ScaleDivisions", "ScaledMousePosition", "ScaleOrigin",%
3709    "ScalePadding", "ScaleRanges", "ScaleRangeStyle", "ScalingFunctions",%
3710    "ScalingMatrix", "ScalingTransform", "Scan", "ScheduledTask",%
3711    "ScheduledTaskActiveQ", "ScheduledTaskInformation",%
3712    "ScheduledTaskInformationData", "ScheduledTaskObject",%
3713    "ScheduledTasks", "SchurDecomposition", "ScientificForm", "ScorerGi",%
3714    "ScorerGiPrime", "ScorerHi", "ScorerHiPrime", "ScreenRectangle",%
3715    "ScreenStyleEnvironment", "ScriptBaselineShifts", "ScriptForm",%
3716    "ScriptLevel", "ScriptMinSize", "ScriptRules",%
3717    "ScriptSizeMultipliers", "Scrollbars", "ScrollingOptions",%
3718    "ScrollPosition", "SearchAdjustment", "SearchBoost",%
3719    "SearchIndexObject", "SearchIndices", "SearchQueryString",%
3720    "SearchResultObject", "SearchSynonyms", "Sec", "Sech",%
3721    "SechDistribution", "SectionGrouping", "SectorChart",%
3722    "SectorChart3D", "SectorOrigin", "SectorSpacing", "SeedRandom",%
3723    "Select", "Selectable", "SelectComponents", "SelectedCells",%
3724    "SelectedNotebook", "SelectFirst", "Selection", "SelectionAnimate",%
3725    "SelectionCell", "SelectionCellCreateCell",%
3726    "SelectionCellDefaultStyle", "SelectionCellParentStyle",%
3727    "SelectionCreateCell", "SelectionDebuggerTag",%
3728    "SelectionDuplicateCell", "SelectionEvaluate",%
3729    "SelectionEvaluateCreateCell", "SelectionMove",%
3730    "SelectionPlaceholder", "SelectionSetStyle", "SelectWithContents",%
3731    "SelfLoops", "SelfLoopStyle", "SemanticImport",%
3732    "SemanticImportString", "SemanticInterpretation",%
3733    "SemialgebraicComponentInstances", "SendMail", "SendMessage",%
3734    "Sequence", "SequenceAlignment", "SequenceCases", "SequenceCount",%
3735    "SequenceFold", "SequenceFoldList", "SequenceForm", "SequenceHold",%
3736    "SequenceLimit", "SequencePosition", "Series", "SeriesCoefficient",%
3737    "SeriesData", "ServiceConnect", "ServiceDisconnect",%
```

```
3738    "ServiceExecute", "ServiceObject", "SessionTime", "Set",%
3739    "SetAccuracy", "SetAlphaChannel", "SetAttributes", "Setbacks",%
3740    "SetBoxFormNamesPacket", "SetCloudDirectory", "SetCookies",%
3741    "SetDelayed", "SetDirectory", "SetEnvironment",%
3742    "SetEvaluationNotebook", "SetFileDate", "SetFileLoadingContext",%
3743    "SetNotebookStatusLine", "SetOptions", "SetOptionsPacket",%
3744    "SetPermissions", "SetPrecision", "SetProperty",%
3745    "SetSelectedNotebook", "SetSharedFunction", "SetSharedVariable",%
3746    "SetSpeechParametersPacket", "SetStreamPosition", "SetSystemOptions",%
3747    "Setter", "SetterBar", "SetterBox", "SetterBoxOptions", "Setting",%
3748    "SetUsers", "SetValue", "Shading", "Shallow", "ShannonWavelet",%
3749    "ShapiroWilkTest", "Share", "SharingList", "Sharpen",%
3750    "ShearingMatrix", "ShearingTransform", "ShellRegion",%
3751    "ShenCastanMatrix", "ShiftedGompertzDistribution",%
3752    "ShiftRegisterSequence", "Short", "ShortDownArrow", "Shortest",%
3753    "ShortestMatch", "ShortestPathFunction", "ShortLeftArrow",%
3754    "ShortRightArrow", "ShortUpArrow", "Show", "ShowAutoSpellCheck",%
3755    "ShowAutoStyles", "ShowCellBracket", "ShowCellLabel", "ShowCellTags",%
3756    "ShowClosedCellArea", "ShowContents", "ShowControls",%
3757    "ShowCursorTracker", "ShowGroupOpenCloseIcon", "ShowGroupOpener",%
3758    "ShowInvisibleCharacters", "ShowPageBreaks",%
3759    "ShowPredictiveInterface", "ShowSelection", "ShowShortBoxForm",%
3760    "ShowSpecialCharacters", "ShowStringCharacters", "ShowSyntaxStyles",%
3761    "ShrinkingDelay", "ShrinkWrapBoundingBox", "SiderealTime",%
3762    "SiegelTheta", "SiegelTukeyTest", "Sign", "Signature",%
3763    "SignedRankTest", "SignedRegionDistance", "SignificanceLevel",%
3764    "SignPadding", "SignTest", "SimilarityRules", "SimpleGraph",%
3765    "SimpleGraphQ", "Simplex", "Simplify", "Sin", "Sinc",%
3766    "SinghMaddalaDistribution", "SingleEvaluation",%
3767    "SingleLetterItalics", "SingleLetterStyle",%
3768    "SingularValueDecomposition", "SingularValueList",%
3769    "SingularValuePlot", "SingularValues", "Sinh", "SinhIntegral",%
3770    "SinIntegral", "SixJSymbol", "Skeleton", "SkeletonTransform",%
3771    "SkellamDistribution", "Skewness", "SkewNormalDistribution",%
3772    "SkinStyle", "Skip", "SliceContourPlot3D", "SliceDensityPlot3D",%
3773    "SliceDistribution", "SliceVectorPlot3D", "Slider", "Slider2D",%
3774    "Slider2DBox", "Slider2DBoxOptions", "SliderBox", "SliderBoxOptions",%
3775    "SlideView", "Slot", "SlotSequence", "Small", "SmallCircle",%
3776    "Smaller", "SmithDecomposition", "SmithDelayCompensator",%
3777    "SmithWatermanSimilarity", "SmoothDensityHistogram",%
3778    "SmoothHistogram", "SmoothHistogram3D", "SmoothKernelDistribution",%
3779    "Snippet", "SocialMediaData", "Socket", "SocketConnect",%
3780    "SocketObject", "SoftmaxLayer", "SokalSneathDissimilarity",%
3781    "SolarEclipse", "SolarSystemFeatureData", "SolidData",%
3782    "SolidRegionQ", "Solve", "SolveAlways", "SolveDelayed", "Sort",%
3783    "SortBy", "Sound", "SoundAndGraphics", "SoundNote", "SoundVolume",%
3784    "SourceLink", "Sow", "Space", "SpaceCurveData", "SpaceForm",%
3785    "Spacer", "Spacings", "Span", "SpanAdjustments",%
3786    "SpanCharacterRounding", "SpanFromAbove", "SpanFromBoth",%
3787    "SpanFromLeft", "SpanLineThickness", "SpanMaxSize", "SpanMinSize",%
3788    "SpanningCharacters", "SpanSymmetric", "SparseArray",%
3789    "SpatialGraphDistribution", "Speak", "SpeakTextPacket",%
3790    "SpearmanRankTest", "SpearmanRho", "SpeciesData", "SpecificityGoal",%
3791    "Spectrogram", "SpectrogramArray", "Specularity",%
```

84

```
3792      "SpellingCorrection", "SpellingCorrectionList",%
3793      "SpellingDictionaries", "SpellingDictionariesPath",%
3794      "SpellingOptions", "SpellingSuggestionsPacket", "Sphere",%
3795      "SphereBox", "SphericalBesselJ", "SphericalBesselY",%
3796      "SphericalHankelH1", "SphericalHankelH2", "SphericalHarmonicY",%
3797      "SphericalPlot3D", "SphericalRegion", "SphericalShell",%
3798      "SpheroidalEigenvalue", "SpheroidalJoiningFactor", "SpheroidalPS",%
3799      "SpheroidalPSPrime", "SpheroidalQS", "SpheroidalQSPrime",%
3800      "SpheroidalRadialFactor", "SpheroidalS1", "SpheroidalS1Prime",%
3801      "SpheroidalS2", "SpheroidalS2Prime", "Splice", "SplicedDistribution",%
3802      "SplineClosed", "SplineDegree", "SplineKnots", "SplineWeights",%
3803      "Split", "SplitBy", "SpokenString", "Sqrt", "SqrtBox",%
3804      "SqrtBoxOptions", "Square", "SquaredEuclideanDistance",%
3805      "SquareFreeQ", "SquareIntersection", "SquareMatrixQ", "SquaresR",%
3806      "SquareSubset", "SquareSubsetEqual", "SquareSuperset",%
3807      "SquareSupersetEqual", "SquareUnion", "SquareWave", "SSSTriangle",%
3808      "StabilityMargins", "StabilityMarginsStyle", "StableDistribution",%
3809      "Stack", "StackBegin", "StackComplete", "StackInhibit",%
3810      "StadiumShape", "StandardAtmosphereData", "StandardDeviation",%
3811      "StandardDeviationFilter", "StandardForm", "Standardize",%
3812      "Standardized", "StandardOceanData", "StandbyDistribution", "Star",%
3813      "StarClusterData", "StarData", "StarGraph", "StartAsynchronousTask",%
3814      "StartingStepSize", "StartOfLine", "StartOfString", "StartProcess",%
3815      "StartScheduledTask", "StartupSound", "StateDimensions",%
3816      "StateFeedbackGains", "StateOutputEstimator", "StateResponse",%
3817      "StateSpaceModel", "StateSpaceRealization", "StateSpaceTransform",%
3818      "StateTransformationLinearize", "StationaryDistribution",%
3819      "StationaryWaveletPacketTransform", "StationaryWaveletTransform",%
3820      "StatusArea", "StatusCentrality", "StepMonitor", "StieltjesGamma",%
3821      "StirlingS1", "StirlingS2", "StopAsynchronousTask",%
3822      "StoppingPowerData", "StopScheduledTask", "StrataVariables",%
3823      "StratonovichProcess", "StreamColorFunction",%
3824      "StreamColorFunctionScaling", "StreamDensityPlot", "StreamPlot",%
3825      "StreamPoints", "StreamPosition", "Streams", "StreamScale",%
3826      "StreamStyle", "String", "StringBreak", "StringByteCount",%
3827      "StringCases", "StringContainsQ", "StringCount", "StringDelete",%
3828      "StringDrop", "StringEndsQ", "StringExpression", "StringExtract",%
3829      "StringForm", "StringFormat", "StringFreeQ", "StringInsert",%
3830      "StringJoin", "StringLength", "StringMatchQ", "StringPadLeft",%
3831      "StringPadRight", "StringPart", "StringPartition", "StringPosition",%
3832      "StringQ", "StringRepeat", "StringReplace", "StringReplaceList",%
3833      "StringReplacePart", "StringReverse", "StringRiffle",%
3834      "StringRotateLeft", "StringRotateRight", "StringSkeleton",%
3835      "StringSplit", "StringStartsQ", "StringTake", "StringTemplate",%
3836      "StringToStream", "StringTrim", "StripBoxes", "StripOnInput",%
3837      "StripWrapperBoxes", "StrokeForm", "StructuralImportance",%
3838      "StructuredArray", "StructuredSelection", "StruveH", "StruveL",%
3839      "Stub", "StudentTDistribution", "Style", "StyleBox",%
3840      "StyleBoxAutoDelete", "StyleData", "StyleDefinitions", "StyleForm",%
3841      "StyleHints", "StyleKeyMapping", "StyleMenuListing",%
3842      "StyleNameDialogSettings", "StyleNames", "StylePrint",%
3843      "StyleSheetPath", "Subdivide", "Subfactorial", "Subgraph",%
3844      "SubMinus", "SubPlus", "SubresultantPolynomialRemainders",%
3845      "SubresultantPolynomials", "Subresultants", "Subscript",%
```

```
3846    "SubscriptBox", "SubscriptBoxOptions", "Subscripted", "Subsequences",%
3847    "Subset", "SubsetEqual", "SubsetQ", "Subsets", "SubStar",%
3848    "SubstitutionSystem", "Subsuperscript", "SubsuperscriptBox",%
3849    "SubsuperscriptBoxOptions", "Subtract", "SubtractFrom", "SubValues",%
3850    "Succeeds", "SucceedsEqual", "SucceedsSlantEqual", "SucceedsTilde",%
3851    "SuchThat", "Sum", "SumConvergence", "SummationLayer", "Sunday",%
3852    "SunPosition", "Sunrise", "Sunset", "SuperDagger", "SuperMinus",%
3853    "SupernovaData", "SuperPlus", "Superscript", "SuperscriptBox",%
3854    "SuperscriptBoxOptions", "Superset", "SupersetEqual", "SuperStar",%
3855    "Surd", "SurdForm", "SurfaceColor", "SurfaceData", "SurfaceGraphics",%
3856    "SurvivalDistribution", "SurvivalFunction", "SurvivalModel",%
3857    "SurvivalModelFit", "SuspendPacket", "SuzukiDistribution",%
3858    "SuzukiGroupSuz", "SwatchLegend", "Switch", "Symbol", "SymbolName",%
3859    "SymletWavelet", "Symmetric", "SymmetricGroup", "SymmetricKey",%
3860    "SymmetricMatrixQ", "SymmetricPolynomial", "SymmetricReduction",%
3861    "Symmetrize", "SymmetrizedArray", "SymmetrizedArrayRules",%
3862    "SymmetrizedDependentComponents", "SymmetrizedIndependentComponents",%
3863    "SymmetrizedReplacePart", "SynchronousInitialization",%
3864    "SynchronousUpdating", "Syntax", "SyntaxForm", "SyntaxInformation",%
3865    "SyntaxLength", "SyntaxPacket", "SyntaxQ", "SystemDialogInput",%
3866    "SystemException", "SystemGet", "SystemHelpPath",%
3867    "SystemInformation", "SystemInformationData", "SystemOpen",%
3868    "SystemOptions", "SystemsModelDelay", "SystemsModelDelayApproximate",%
3869    "SystemsModelDelete", "SystemsModelDimensions",%
3870    "SystemsModelExtract", "SystemsModelFeedbackConnect",%
3871    "SystemsModelLabels", "SystemsModelLinearity", "SystemsModelMerge",%
3872    "SystemsModelOrder", "SystemsModelParallelConnect",%
3873    "SystemsModelSeriesConnect", "SystemsModelStateFeedbackConnect",%
3874    "SystemsModelVectorRelativeOrders", "SystemStub", "Tab",%
3875    "TabFilling", "Table", "TableAlignments", "TableDepth",%
3876    "TableDirections", "TableForm", "TableHeadings", "TableSpacing",%
3877    "TableView", "TableViewBox", "TabSpacings", "TabView", "TabViewBox",%
3878    "TabViewBoxOptions", "TagBox", "TagBoxNote", "TagBoxOptions",%
3879    "TaggingRules", "TagSet", "TagSetDelayed", "TagStyle", "TagUnset",%
3880    "Take", "TakeDrop", "TakeLargest", "TakeLargestBy", "TakeSmallest",%
3881    "TakeSmallestBy", "TakeWhile", "Tally", "Tan", "Tanh",%
3882    "TargetDevice", "TargetFunctions", "TargetUnits", "TautologyQ",%
3883    "TelegraphProcess", "TemplateApply", "TemplateArgBox", "TemplateBox",%
3884    "TemplateBoxOptions", "TemplateEvaluate", "TemplateExpression",%
3885    "TemplateIf", "TemplateObject", "TemplateSequence", "TemplateSlot",%
3886    "TemplateSlotSequence", "TemplateUnevaluated", "TemplateVerbatim",%
3887    "TemplateWith", "TemporalData", "TemporalRegularity", "Temporary",%
3888    "TemporaryVariable", "TensorContract", "TensorDimensions",%
3889    "TensorExpand", "TensorProduct", "TensorQ", "TensorRank",%
3890    "TensorReduce", "TensorSymmetry", "TensorTranspose", "TensorWedge",%
3891    "TestID", "TestReport", "TestReportObject", "TestResultObject",%
3892    "Tetrahedron", "TetrahedronBox", "TetrahedronBoxOptions", "TeXForm",%
3893    "TeXSave", "Text", "Text3DBox", "Text3DBoxOptions", "TextAlignment",%
3894    "TextBand", "TextBoundingBox", "TextBox", "TextCases", "TextCell",%
3895    "TextClipboardType", "TextData", "TextElement", "TextForm",%
3896    "TextGrid", "TextJustification", "TextLine", "TextPacket",%
3897    "TextParagraph", "TextPosition", "TextRecognize", "TextSearch",%
3898    "TextSearchPage", "TextSearchReport", "TextSentences", "TextString",%
3899    "TextStructure", "TextStyle", "Texture", "TextureCoordinateFunction",%
```

```
3900    "TextureCoordinateScaling", "TextWords", "Therefore",%
3901    "ThermodynamicData", "ThermometerGauge", "Thick", "Thickness",%
3902    "Thin", "Thinning", "ThisLink", "ThompsonGroupTh", "Thread",%
3903    "ThreadDepth", "ThreeJSymbol", "Threshold", "Through", "Throw",%
3904    "ThueMorse", "Thumbnail", "Thursday", "Ticks", "TicksStyle", "Tilde",%
3905    "TildeEqual", "TildeFullEqual", "TildeTilde", "TimeConstrained",%
3906    "TimeConstraint", "TimeDirection", "TimeFormat", "TimelinePlot",%
3907    "TimeObject", "TimeObjectQ", "Times", "TimesBy", "TimeSeries",%
3908    "TimeSeriesAggregate", "TimeSeriesForecast", "TimeSeriesInsert",%
3909    "TimeSeriesInvertibility", "TimeSeriesMap", "TimeSeriesMapThread",%
3910    "TimeSeriesModel", "TimeSeriesModelFit", "TimeSeriesResample",%
3911    "TimeSeriesRescale", "TimeSeriesShift", "TimeSeriesThread",%
3912    "TimeSeriesWindow", "TimeUsed", "TimeValue",%
3913    "TimeWarpingCorrespondence", "TimeWarpingDistance", "TimeZone",%
3914    "TimeZoneConvert", "TimeZoneOffset", "Timing", "Tiny",%
3915    "TitleGrouping", "TitsGroupT", "ToBoxes", "ToCharacterCode",%
3916    "ToColor", "ToContinuousTimeModel", "ToDate", "Today",%
3917    "ToDiscreteTimeModel", "ToEntity", "ToeplitzMatrix", "ToExpression",%
3918    "ToFileName", "Together", "Toggle", "ToggleFalse", "Toggler",%
3919    "TogglerBar", "TogglerBox", "TogglerBoxOptions", "ToHeldExpression",%
3920    "ToInvertibleTimeSeries", "TokenWords", "Tolerance", "ToLowerCase",%
3921    "Tomorrow", "ToNumberField", "TooBig", "Tooltip", "TooltipBox",%
3922    "TooltipBoxOptions", "TooltipDelay", "TooltipStyle", "Top",%
3923    "TopHatTransform", "ToPolarCoordinates", "TopologicalSort",%
3924    "ToRadicals", "ToRules", "ToSphericalCoordinates", "ToString",%
3925    "Total", "TotalHeight", "TotalLayer", "TotalVariationFilter",%
3926    "TotalWidth", "TouchPosition", "TouchscreenAutoZoom",%
3927    "TouchscreenControlPlacement", "ToUpperCase", "Tr", "Trace",%
3928    "TraceAbove", "TraceAction", "TraceBackward", "TraceDepth",%
3929    "TraceDialog", "TraceForward", "TraceInternal", "TraceLevel",%
3930    "TraceOff", "TraceOn", "TraceOriginal", "TracePrint", "TraceScan",%
3931    "TrackedSymbols", "TrackingFunction", "TracyWidomDistribution",%
3932    "TradingChart", "TraditionalForm", "TraditionalFunctionNotation",%
3933    "TraditionalNotation", "TraditionalOrder", "TransferFunctionCancel",%
3934    "TransferFunctionExpand", "TransferFunctionFactor",%
3935    "TransferFunctionModel", "TransferFunctionPoles",%
3936    "TransferFunctionTransform", "TransferFunctionZeros",%
3937    "TransformationClass", "TransformationFunction",%
3938    "TransformationFunctions", "TransformationMatrix",%
3939    "TransformedDistribution", "TransformedField", "TransformedProcess",%
3940    "TransformedRegion", "TransitionDirection", "TransitionDuration",%
3941    "TransitionEffect", "TransitiveClosureGraph",%
3942    "TransitiveReductionGraph", "Translate", "TranslationOptions",%
3943    "TranslationTransform", "Transliterate", "Transparent",%
3944    "TransparentColor", "Transpose", "TrapSelection", "TravelDirections",%
3945    "TravelDirectionsData", "TravelDistance", "TravelDistanceList",%
3946    "TravelMethod", "TravelTime", "TreeForm", "TreeGraph", "TreeGraphQ",%
3947    "TreePlot", "TrendStyle", "Triangle", "TriangleWave",%
3948    "TriangularDistribution", "TriangulateMesh", "Trig", "TrigExpand",%
3949    "TrigFactor", "TrigFactorList", "Trigger", "TrigReduce", "TrigToExp",%
3950    "TrimmedMean", "TropicalStormData", "True", "TrueQ",%
3951    "TruncatedDistribution", "TsallisQExponentialDistribution",%
3952    "TsallisQGaussianDistribution", "TTest", "Tube",%
3953    "TubeBezierCurveBox", "TubeBezierCurveBoxOptions", "TubeBox",%
```

```
3954        "TubeBoxOptions", "TubeBSplineCurveBox",%
3955        "TubeBSplineCurveBoxOptions", "Tuesday", "TukeyLambdaDistribution",%
3956        "TukeyWindow", "TunnelData", "Tuples", "TuranGraph", "TuringMachine",%
3957        "TuttePolynomial", "UnateQ", "Uncompress", "Undefined", "UnderBar",%
3958        "Underflow", "Underlined", "Underoverscript", "UnderoverscriptBox",%
3959        "UnderoverscriptBoxOptions", "Underscript", "UnderscriptBox",%
3960        "UnderscriptBoxOptions", "UnderseaFeatureData", "UndirectedEdge",%
3961        "UndirectedGraph", "UndirectedGraphQ", "UndoOptions",%
3962        "UndoTrackedVariables", "Unequal", "UnequalTo", "Unevaluated",%
3963        "UniformDistribution", "UniformGraphDistribution",%
3964        "UniformSumDistribution", "Uninstall", "Union", "UnionPlus",%
3965        "Unique", "UnitaryMatrixQ", "UnitBox", "UnitConvert",%
3966        "UnitDimensions", "Unitize", "UnitRootTest", "UnitSimplify",%
3967        "UnitStep", "UnitSystem", "UnitTriangle", "UnitVector",%
3968        "UnityDimensions", "UniverseModelData", "UniversityData", "UnixTime",%
3969        "Unprotect", "UnsameQ", "UnsavedVariables", "Unset", "UnsetShared",%
3970        "UntrackedVariables", "Up", "UpArrow", "UpArrowBar",%
3971        "UpArrowDownArrow", "Update", "UpdateDynamicObjects",%
3972        "UpdateDynamicObjectsSynchronous", "UpdateInterval",%
3973        "UpdateSearchIndex", "UpDownArrow", "UpEquilibrium", "UpperCaseQ",%
3974        "UpperLeftArrow", "UpperRightArrow", "UpperTriangularize",%
3975        "Upsample", "UpSet", "UpSetDelayed", "UpTee", "UpTeeArrow", "UpTo",%
3976        "UpValues", "URL", "URLBuild", "URLDecode", "URLDispatcher",%
3977        "URLDownload", "URLEncode", "URLExecute", "URLExistsQ", "URLExpand",%
3978        "URLFetch", "URLFetchAsynchronous", "URLParse", "URLQueryDecode",%
3979        "URLQueryEncode", "URLRead", "URLSave", "URLSaveAsynchronous",%
3980        "URLShorten", "URLSubmit", "UseGraphicsRange", "UserDefinedWavelet",%
3981        "Using", "UsingFrontEnd", "UtilityFunction", "V2Get",%
3982        "ValidationLength", "ValidationSet", "Value", "ValueBox",%
3983        "ValueBoxOptions", "ValueDimensions", "ValueForm", "ValueQ",%
3984        "Values", "ValuesData", "Variables", "Variance",%
3985        "VarianceEquivalenceTest", "VarianceEstimatorFunction",%
3986        "VarianceGammaDistribution", "VarianceTest", "VectorAngle",%
3987        "VectorColorFunction", "VectorColorFunctionScaling",%
3988        "VectorDensityPlot", "VectorGlyphData", "VectorPlot", "VectorPlot3D",%
3989        "VectorPoints", "VectorQ", "Vectors", "VectorScale", "VectorStyle",%
3990        "Vee", "Verbatim", "Verbose", "VerboseConvertToPostScriptPacket",%
3991        "VerificationTest", "VerifyConvergence",%
3992        "VerifySecurityCertificates", "VerifySolutions",%
3993        "VerifyTestAssumptions", "Version", "VersionNumber", "VertexAdd",%
3994        "VertexCapacity", "VertexColors", "VertexComponent",%
3995        "VertexConnectivity", "VertexContract", "VertexCoordinateRules",%
3996        "VertexCoordinates", "VertexCorrelationSimilarity",%
3997        "VertexCosineSimilarity", "VertexCount", "VertexCoverQ",%
3998        "VertexDataCoordinates", "VertexDegree", "VertexDelete",%
3999        "VertexDiceSimilarity", "VertexEccentricity", "VertexInComponent",%
4000        "VertexInDegree", "VertexIndex", "VertexJaccardSimilarity",%
4001        "VertexLabeling", "VertexLabels", "VertexLabelStyle", "VertexList",%
4002        "VertexNormals", "VertexOutComponent", "VertexOutDegree", "VertexQ",%
4003        "VertexRenderingFunction", "VertexReplace", "VertexShape",%
4004        "VertexShapeFunction", "VertexSize", "VertexStyle",%
4005        "VertexTextureCoordinates", "VertexWeight", "Vertical",%
4006        "VerticalBar", "VerticalForm", "VerticalGauge", "VerticalSeparator",%
4007        "VerticalSlider", "VerticalTilde", "ViewAngle", "ViewCenter",%
```

```
4008    "ViewMatrix", "ViewPoint", "ViewPointSelectorSettings", "ViewPort",%
4009    "ViewRange", "ViewVector", "ViewVertical", "VirtualGroupData",%
4010    "Visible", "VisibleCell", "VoigtDistribution", "VolcanoData",%
4011    "Volume", "VonMisesDistribution", "VoronoiMesh", "WaitAll",%
4012    "WaitAsynchronousTask", "WaitNext", "WaitUntil",%
4013    "WakebyDistribution", "WalleniusHypergeometricDistribution",%
4014    "WaringYuleDistribution", "WarpingCorrespondence", "WarpingDistance",%
4015    "WatershedComponents", "WatsonUSquareTest",%
4016    "WattsStrogatzGraphDistribution", "WaveletBestBasis",%
4017    "WaveletFilterCoefficients", "WaveletImagePlot", "WaveletListPlot",%
4018    "WaveletMapIndexed", "WaveletMatrixPlot", "WaveletPhi", "WaveletPsi",%
4019    "WaveletScale", "WaveletScalogram", "WaveletThreshold",%
4020    "WeaklyConnectedComponents", "WeaklyConnectedGraphComponents",%
4021    "WeaklyConnectedGraphQ", "WeakStationarity", "WeatherData",%
4022    "WeatherForecastData", "WeberE", "Wedge", "Wednesday",%
4023    "WeibullDistribution", "WeierstrassHalfPeriods",%
4024    "WeierstrassInvariants", "WeierstrassP", "WeierstrassPPrime",%
4025    "WeierstrassSigma", "WeierstrassZeta", "WeightedAdjacencyGraph",%
4026    "WeightedAdjacencyMatrix", "WeightedData", "WeightedGraphQ",%
4027    "Weights", "WelchWindow", "WheelGraph", "WhenEvent", "Which",%
4028    "While", "White", "WhiteNoiseProcess", "WhitePoint", "Whitespace",%
4029    "WhitespaceCharacter", "WhittakerM", "WhittakerW", "WienerFilter",%
4030    "WienerProcess", "WignerD", "WignerSemicircleDistribution",%
4031    "WikipediaData", "WikipediaSearch", "WilksW", "WilksWTest",%
4032    "WindDirectionData", "WindowClickSelect", "WindowElements",%
4033    "WindowFloating", "WindowFrame", "WindowFrameElements",%
4034    "WindowMargins", "WindowMovable", "WindowOpacity", "WindowSelected",%
4035    "WindowSize", "WindowStatusArea", "WindowTitle", "WindowToolbars",%
4036    "WindowWidth", "WindSpeedData", "WindVectorData",%
4037    "WishartMatrixDistribution", "With", "WolframAlpha",%
4038    "WolframAlphaDate", "WolframAlphaQuantity", "WolframAlphaResult",%
4039    "WolframLanguageData", "Word", "WordBoundary", "WordCharacter",%
4040    "WordCloud", "WordCount", "WordCounts", "WordData", "WordDefinition",%
4041    "WordFrequency", "WordFrequencyData", "WordList", "WordOrientation",%
4042    "WordSearch", "WordSeparators", "WordSpacings", "WordStem",%
4043    "WordTranslation", "WorkingPrecision", "WrapAround", "Write",%
4044    "WriteLine", "WriteString", "Wronskian", "XMLElement", "XMLObject",%
4045    "XMLTemplate", "Xnor", "Xor", "XYZColor", "Yellow", "Yesterday",%
4046    "YuleDissimilarity", "ZernikeR", "ZeroSymmetric", "ZeroTest",%
4047    "ZeroWidthTimes", "Zeta", "ZetaZero", "ZIPCodeData",%
4048    "ZipfDistribution", "ZoomCenter", "ZoomFactor", "ZTest",%
4049    "ZTransform"%
4050    }%
4051    morendkeywords={%
4052    "$Aborted", "$ActivationGroupID", "$ActivationKey",%
4053    "$ActivationUserRegistered", "$AddOnsDirectory",%
4054    "$AllowExternalChannelFunctions", "$AssertFunction", "$Assumptions",%
4055    "$AsynchronousTask", "$AudioOutputDevices", "$BaseDirectory",%
4056    "$BatchInput", "$BatchOutput", "$BoxForms", "$ByteOrdering",%
4057    "$CacheBaseDirectory", "$Canceled", "$ChannelBase",%
4058    "$CharacterEncoding", "$CharacterEncodings", "$CloudBase",%
4059    "$CloudConnected", "$CloudCreditsAvailable", "$CloudEvaluation",%
4060    "$CloudExpressionBase", "$CloudRootDirectory", "$CloudSymbolBase",%
4061    "$CloudVersion", "$CloudVersionNumber", "$CommandLine",%
```

```
4062        "$CompilationTarget", "$ConditionHold", "$ConfiguredKernels",%
4063        "$Context", "$ContextPath", "$ControlActiveSetting", "$Cookies",%
4064        "$CookieStore", "$CreationDate", "$CurrentLink", "$DateStringFormat",%
4065        "$DefaultAudioOutputDevice", "$DefaultFont", "$DefaultFrontEnd",%
4066        "$DefaultImagingDevice", "$DefaultLocalBase", "$DefaultPath",%
4067        "$Display", "$DisplayFunction", "$DistributedContexts",%
4068        "$DynamicEvaluation", "$Echo", "$EmbedCodeEnvironments",%
4069        "$EmbeddableServices", "$EntityStores", "$Epilog",%
4070        "$EvaluationCloudObject", "$EvaluationEnvironment", "$ExportFormats",%
4071        "$Failed", "$FinancialDataSource", "$FontFamilies", "$FormatType",%
4072        "$FrontEnd", "$FrontEndSession", "$GeoEntityTypes", "$GeoLocation",%
4073        "$GeoLocationCity", "$GeoLocationCountry", "$GeoLocationPrecision",%
4074        "$GeoLocationSource", "$HistoryLength", "$HomeDirectory",%
4075        "$HTMLExportRules", "$HTTPCookies", "$HTTPRequest", "$IgnoreEOF",%
4076        "$ImageFormattingWidth", "$ImagingDevice", "$ImagingDevices",%
4077        "$ImportFormats", "$InitialDirectory", "$Input", "$InputFileName",%
4078        "$InputStreamMethods", "$Inspector", "$InstallationDate",%
4079        "$InstallationDirectory", "$InterfaceEnvironment",%
4080        "$InterpreterTypes", "$IterationLimit", "$KernelCount", "$KernelID",%
4081        "$Language", "$LaunchDirectory", "$LibraryPath",%
4082        "$LicenseExpirationDate", "$LicenseID", "$LicenseProcesses",%
4083        "$LicenseServer", "$LicenseSubprocesses", "$LicenseType", "$Line",%
4084        "$Linked", "$LinkSupported", "$LoadedFiles", "$LocalBase",%
4085        "$LocalSymbolBase", "$MachineAddresses", "$MachineDomain",%
4086        "$MachineDomains", "$MachineEpsilon", "$MachineID", "$MachineName",%
4087        "$MachinePrecision", "$MachineType", "$MaxExtraPrecision",%
4088        "$MaxLicenseProcesses", "$MaxLicenseSubprocesses",%
4089        "$MaxMachineNumber", "$MaxNumber", "$MaxPiecewiseCases",%
4090        "$MaxPrecision", "$MaxRootDegree", "$MessageGroups", "$MessageList",%
4091        "$MessagePrePrint", "$Messages", "$MinMachineNumber", "$MinNumber",%
4092        "$MinorReleaseNumber", "$MinPrecision", "$ModuleNumber",%
4093        "$NetworkLicense", "$NewMessage", "$NewSymbol", "$Notebooks",%
4094        "$NumberMarks", "$Off", "$OperatingSystem", "$Output",%
4095        "$OutputForms", "$OutputSizeLimit", "$OutputStreamMethods",%
4096        "$Packages", "$ParentLink", "$ParentProcessID", "$PasswordFile",%
4097        "$PatchLevelID", "$Path", "$PathnameSeparator", "$PerformanceGoal",%
4098        "$Permissions", "$PermissionsGroupBase", "$PhoneNumber",%
4099        "$PipeSupported", "$PlotTheme", "$Post", "$Pre",%
4100        "$PreferencesDirectory", "$PrePrint", "$PreRead", "$PrintForms",%
4101        "$PrintLiteral", "$Printout3DPreviewer", "$ProcessID",%
4102        "$ProcessorCount", "$ProcessorType", "$ProductInformation",%
4103        "$ProgramName", "$RandomState", "$RecursionLimit",%
4104        "$RegisteredDeviceClasses", "$RegisteredUserName", "$ReleaseNumber",%
4105        "$RequesterAddress", "$RequesterWolframID", "$RequesterWolframUUID",%
4106        "$RootDirectory", "$ScheduledTask", "$ScriptCommandLine",%
4107        "$ScriptInputString", "$Services", "$SessionID", "$SetParentLink",%
4108        "$SharedFunctions", "$SharedVariables", "$SMSDestination",%
4109        "$SoundDisplay", "$SoundDisplayFunction", "$SourceLink",%
4110        "$SuppressInputFormHeads", "$SynchronousEvaluation",%
4111        "$SyntaxHandler", "$System", "$SystemCharacterEncoding", "$SystemID",%
4112        "$SystemMemory", "$SystemShell", "$SystemTimeZone",%
4113        "$SystemWordLength", "$TemplatePath", "$TemporaryDirectory",%
4114        "$TemporaryPrefix", "$TextStyle", "$TimedOut", "$TimeUnit",%
4115        "$TimeZone", "$TimeZoneEntity", "$TopDirectory", "$TraceOff",%
```

```
4116    "$TraceOn", "$TracePattern", "$TracePostAction", "$TracePreAction",%
4117    "$UnitSystem", "$Urgent", "$UserAddOnsDirectory",%
4118    "$UserAgentLanguages", "$UserAgentMachine", "$UserAgentName",%
4119    "$UserAgentOperatingSystem", "$UserAgentString", "$UserAgentVersion",%
4120    "$UserBaseDirectory", "$UserDocumentsDirectory", "$UserName",%
4121    "$Version", "$VersionNumber", "$WolframID", "$WolframUUID"%
4122  }%
4123 }

4124 \lst@definelanguage[5.2]{Mathematica}[3.0]{Mathematica}{%
4125   morekeywords={Above, AbsoluteOptions, AbsoluteTiming, AccountingForm,%
4126     AccuracyGoal, Active, ActiveItem, AddOnHelpPath, AdjustmentBox,%
4127     AdjustmentBoxOptions, After, AiryAiPrime, AlgebraicRulesData,%
4128     Algebraics, Alias, AlignmentMarker, AllowInlineCells,%
4129     AllowScriptLevelChange, Analytic, AnimationCycleOffset,%
4130     AnimationCycleRepetitions, AnimationDirection, AnimationDisplayTime,%
4131     ApartSquareFree, AppellF1, ArgumentCountQ, ArrayDepth, ArrayPlot,%
4132     ArrayQ, ArrayRules, AspectRatioFixed, Assuming, Assumptions,%
4133     AutoDelete, AutoEvaluateEvents, AutoGeneratedPackage, AutoIndent,%
4134     AutoIndentSpacings, AutoItalicWords, AutoloadPath, AutoOpenNotebooks,%
4135     AutoOpenPalettes, AutoScroll, AutoSpacing, AutoStyleOptions, Axis,%
4136     BackgroundTasksSettings, Backsubstitution, Backward, Baseline, Before,%
4137     BeginDialogPacket, BeginFrontEndInteractionPacket, Below, BezoutMatrix,%
4138     BinaryFormat, BinaryGet, BinaryRead, BinaryReadList, BinaryWrite,%
4139     BitAnd, BitNot, BitOr, BitXor, Black, BlankForm, Blue, Boole, Booleans,%
4140     Bottom, Bounds, Box, BoxBaselineShift, BoxData, BoxDimensions,%
4141     BoxFormFormatTypes, BoxFrame, BoxMargins, BoxRegion, Brown, Buchberger,%
4142     Button, ButtonBox, ButtonBoxOptions, ButtonCell, ButtonContents,%
4143     ButtonData, ButtonEvaluator, ButtonExpandable, ButtonFrame,%
4144     ButtonFunction, ButtonMargins, ButtonMinHeight, ButtonNote,%
4145     ButtonNotebook, ButtonSource, ButtonStyle, ButtonStyleMenuListing,%
4146     ByteOrdering, CallPacket, CarmichaelLambda, Cell, CellAutoOverwrite,%
4147     CellBaseline, CellBoundingBox, CellBracketOptions, CellContents,%
4148     CellDingbat, CellEditDuplicate, CellElementsBoundingBox,%
4149     CellElementSpacings, CellEvaluationDuplicate, CellFrame,%
4150     CellFrameColor, CellFrameLabelMargins, CellFrameLabels,%
4151     CellFrameMargins, CellGroup, CellGroupData, CellGrouping,%
4152     CellGroupingRules, CellHorizontalScrolling, CellLabel,%
4153     CellLabelAutoDelete, CellLabelMargins, CellLabelPositioning,%
4154     CellMargins, CellObject, CellOpen, CellPasswords, CellPrint, CellSize,%
4155     CellStyle, CellTags, CellularAutomaton, Center, CharacterEncoding,%
4156     CharacterEncodingsPath, CharacteristicPolynomial, CharacterRange,%
4157     CheckAll, CholeskyDecomposition, Clip, ClipboardNotebook, Closed,%
4158     ClosingAutoSave, CoefficientArrays, CoefficientDomain,%
4159     CofactorExpansion, ColonForm, ColorFunctionScaling, ColorRules,%
4160     ColorSelectorSettings, Column, ColumnAlignments, ColumnLines,%
4161     ColumnsEqual, ColumnSpacings, ColumnWidths, CommonDefaultFormatTypes,%
4162     CompileOptimizations, CompletionsListPacket, Complexes,%
4163     ComplexityFunction, Compose, ComposeSeries, ConfigurationPath,%
4164     ConjugateTranspose, Connect, ConsoleMessage, ConsoleMessagePacket,%
4165     ConsolePrint, ContentsBoundingBox, ContextToFileName,%
4166     ContinuedFraction, ConversionOptions, ConversionRules,%
4167     ConvertToBitmapPacket, ConvertToPostScript, ConvertToPostScriptPacket,%
4168     Copyable, CoshIntegral, CounterAssignments, CounterBox,%
4169     CounterBoxOptions, CounterEvaluator, CounterFunction,%
```

```
4170    CounterIncrements, CounterStyle, CounterStyleMenuListing,%
4171    CreatePalettePacket, Cross, CurrentlySpeakingPacket, Cyan,%
4172    CylindricalDecomposition, DampingFactor, DataRange, Debug, DebugTag,%
4173    Decimal, DedekindEta, DefaultDuplicateCellStyle, DefaultFontProperties,%
4174    DefaultFormatType, DefaultFormatTypeForStyle, DefaultInlineFormatType,%
4175    DefaultInputFormatType, DefaultNaturalLanguage, DefaultNewCellStyle,%
4176    DefaultNewInlineCellStyle, DefaultNotebook, DefaultOutputFormatType,%
4177    DefaultStyleDefinitions, DefaultTextFormatType,%
4178    DefaultTextInlineFormatType, DefaultValues, DefineExternal,%
4179    DegreeLexicographic, DegreeReverseLexicographic, Deletable,%
4180    DeleteContents, DeletionWarning, DelimiterFlashTime, DelimiterMatching,%
4181    Delimiters, DependentVariables, DiacriticalPositioning, DialogLevel,%
4182    DifferenceOrder, DigitCharacter, DigitCount, DiracDelta, Direction,%
4183    DirectoryName, DisableConsolePrintPacket, DiscreteDelta,%
4184    DisplayAnimation, DisplayEndPacket, DisplayFlushImagePacket,%
4185    DisplayForm, DisplayPacket, DisplayRules, DisplaySetSizePacket,%
4186    DisplayString, DivisionFreeRowReduction, DOSTextFormat,%
4187    DoubleExponential, DoublyInfinite, Down, DragAndDrop, DrawHighlighted,%
4188    DualLinearProgramming, DumpGet, DumpSave, Edit, Editable,%
4189    EditButtonSettings, EditCellTagsSettings, EditDefinition, EditIn,%
4190    Element, EliminationOrder, EllipticExpPrime, EllipticNomeQ,%
4191    EllipticReducedHalfPeriods, EllipticThetaPrime, Empty,%
4192    EnableConsolePrintPacket, Encoding, EndAdd, EndDialogPacket,%
4193    EndFrontEndInteractionPacket, EndOfLine, EndOfString, Enter,%
4194    EnterExpressionPacket, EnterTextPacket, EqualColumns, EqualRows,%
4195    EquatedTo, Erfi, ErrorBox, ErrorBoxOptions, ErrorNorm, ErrorPacket,%
4196    ErrorsDialogSettings, Evaluatable, EvaluatePacket, EvaluationCell,%
4197    EvaluationCompletionAction, EvaluationMonitor, EvaluationNotebook,%
4198    Evaluator, EvaluatorNames, EventEvaluator, ExactNumberQ,%
4199    ExactRootIsolation, Except, ExcludedForms, Exists, ExitDialog,%
4200    ExponentPosition, ExponentStep, Export, ExportAutoReplacements,%
4201    ExportPacket, ExportString, ExpressionPacket, ExpToTrig, Extension,%
4202    ExternalCall, ExternalDataCharacterEncoding, Extract, Fail,%
4203    FEDisableConsolePrintPacket, FEEnableConsolePrintPacket, Fibonacci,%
4204    File, FileFormat, FileInformation, FileName, FileNameDialogSettings,%
4205    FindFit, FindInstance, FindMaximum, FindSettings, FitAll,%
4206    FlushPrintOutputPacket, Font, FontColor, FontFamily, FontName,%
4207    FontPostScriptName, FontProperties, FontReencoding, FontSize,%
4208    FontSlant, FontSubstitutions, FontTracking, FontVariations, FontWeight,%
4209    ForAll, FormatRules, FormatTypeAutoConvert, FormatValues, FormBox,%
4210    FormBoxOptions, Forward, ForwardBackward, FourierCosTransform,%
4211    FourierParameters, FourierSinTransform, FourierTransform,%
4212    FractionalPart, FractionBox, FractionBoxOptions, FractionLine,%
4213    FrameBox, FrameBoxOptions, FresnelC, FresnelS, FromContinuedFraction,%
4214    FromDigits, FrontEndExecute, FrontEndObject, FrontEndStackSize,%
4215    FrontEndToken, FrontEndTokenExecute, FrontEndVersion, Full, FullAxes,%
4216    FullSimplify, FunctionExpand, FunctionInterpolation, GaussKronrod,%
4217    GaussPoints, GenerateBitmapCaches, GenerateConditions, GeneratedCell,%
4218    GeneratedParameters, Generic, GetBoundingBoxSizePacket, GetContext,%
4219    GetFileName, GetFrontEndOptionsDataPacket,%
4220    GetLinebreakInformationPacket, GetMenusPacket,%
4221    GetPageBreakInformationPacket, Glaisher, GlobalPreferences,%
4222    GlobalSession, Gradient, GraphicsData, GraphicsGrouping, Gray, Green,%
4223    Grid, GridBaseline, GridBox, GridBoxOptions, GridCreationSettings,%
```

92

```
4224    GridDefaultElement, GridFrame, GridFrameMargins, GroupPageBreakWithin,%
4225    HarmonicNumber, Hash, HashTable, HeadCompose, HelpBrowserLookup,%
4226    HelpBrowserNotebook, HelpBrowserSettings, HessenbergDecomposition,%
4227    Hessian, HoldAllComplete, HoldComplete, HoldPattern, Horizontal,%
4228    HorizontalForm, HorizontalScrollPosition, HTMLSave,%
4229    Hypergeometric0F1Regularized, Hypergeometric1F1Regularized,%
4230    Hypergeometric2F1Regularized, HypergeometricPFQ,%
4231    HypergeometricPFQRegularized, HyperlinkCreationSettings, Hyphenation,%
4232    HyphenationOptions, IgnoreCase, ImageCache, ImageCacheValid,%
4233    ImageMargins, ImageOffset, ImageRangeCache, ImageRegion,%
4234    ImageResolution, ImageRotated, ImageSize, Import,%
4235    ImportAutoReplacements, ImportString, IncludeFileExtension,%
4236    IncludeSingularTerm, IndentingNewlineSpacings, IndentMaxFraction,%
4237    IndexCreationOptions, Inequality, InexactNumberQ, InexactNumbers,%
4238    Inherited, InitializationCell, InitializationCellEvaluation,%
4239    InitializationCellWarning, InlineCounterAssignments,%
4240    InlineCounterIncrements, InlineRules, InputAliases, InputAutoFormat,%
4241    InputAutoReplacements, InputGrouping, InputNamePacket, InputNotebook,%
4242    InputPacket, InputSettings, InputStringPacket, InputToBoxFormPacket,%
4243    InputToInputForm, InputToStandardForm, InsertionPointObject,%
4244    IntegerExponent, IntegerPart, Integers, Interactive, Interlaced,%
4245    InterpolationOrder, InterpolationPoints, InterpolationPrecision,%
4246    InterpretationBox, InterpretationBoxOptions, InterpretTemplate,%
4247    InterruptSettings, Interval, IntervalIntersection, IntervalMemberQ,%
4248    IntervalUnion, InverseBetaRegularized, InverseEllipticNomeQ,%
4249    InverseErf, InverseErfc, InverseFourierCosTransform,%
4250    InverseFourierSinTransform, InverseFourierTransform,%
4251    InverseGammaRegularized, InverseJacobiCD, InverseJacobiCN,%
4252    InverseJacobiCS, InverseJacobiDC, InverseJacobiDN, InverseJacobiDS,%
4253    InverseJacobiNC, InverseJacobiND, InverseJacobiNS, InverseJacobiSC,%
4254    InverseJacobiSD, InverseLaplaceTransform, InverseWeierstrassP,%
4255    InverseZTransform, Jacobian, JacobiCD, JacobiCN, JacobiCS, JacobiDC,%
4256    JacobiDN, JacobiDS, JacobiNC, JacobiND, JacobiNS, JacobiSC, JacobiSD,%
4257    JordanDecomposition, K, Khinchin, KleinInvariantJ, KroneckerDelta,%
4258    Language, LanguageCategory, LaplaceTransform, Larger, Launch,%
4259    LayoutInformation, Left, LetterCharacter, Lexicographic, LicenseID,%
4260    LimitsPositioning, LimitsPositioningTokens, LinearSolveFunction,%
4261    LinebreakAdjustments, LineBreakWithin, LineForm, LineIndent,%
4262    LineSpacing, LineWrapParts, LinkActivate, LinkClose, LinkConnect,%
4263    LinkConnectedQ, LinkCreate, LinkError, LinkFlush, LinkHost,%
4264    LinkInterrupt, LinkLaunch, LinkMode, LinkObject, LinkOpen, LinkOptions,%
4265    LinkPatterns, LinkProtocol, LinkRead, LinkReadHeld, LinkReadyQ, Links,%
4266    LinkWrite, LinkWriteHeld, ListConvolve, ListCorrelate, Listen,%
4267    ListInterpolation, ListQ, LiteralSearch, LongestMatch, LongForm,%
4268    Loopback, LUBackSubstitution, LUDecomposition, MachineID, MachineName,%
4269    MachinePrecision, MacintoshSystemPageSetup, Magenta, Magnification,%
4270    MakeBoxes, MakeExpression, MakeRules, Manual, MatchLocalNameQ,%
4271    MathematicaNotation, MathieuC, MathieuCharacteristicA,%
4272    MathieuCharacteristicB, MathieuCharacteristicExponent, MathieuCPrime,%
4273    MathieuS, MathieuSPrime, MathMLForm, MathMLText, MatrixRank, Maximize,%
4274    MaxIterations, MaxPlotPoints, MaxPoints, MaxRecursion, MaxStepFraction,%
4275    MaxSteps, MaxStepSize, Mean, Median, MeijerG, MenuPacket,%
4276    MessageOptions, MessagePacket, MessagesNotebook, MetaCharacters,%
4277    Method, MethodOptions, Minimize, MinRecursion, MinSize, Mode,%
```

93

```
4278    ModularLambda, MonomialOrder, MonteCarlo, Most, MousePointerNote,%
4279    MultiDimensional, MultilaunchWarning, MultilineFunction,%
4280    MultiplicativeOrder, Multiplicity, Nand,%
4281    NeedCurrentFrontEndPackagePacket, NeedCurrentFrontEndSymbolsPacket,%
4282    NestedScriptRules, NestWhile, NestWhileList, NevilleThetaC,%
4283    NevilleThetaD, NevilleThetaN, NevilleThetaS, Newton, Next, NHoldAll,%
4284    NHoldFirst, NHoldRest, NMaximize, NMinimize, NonAssociative,%
4285    NonPositive, Nor, Norm, NormalGrouping, NormalSelection, NormFunction,%
4286    Notebook, NotebookApply, NotebookAutoSave, NotebookClose,%
4287    NotebookConvert, NotebookConvertSettings, NotebookCreate,%
4288    NotebookCreateReturnObject, NotebookDefault, NotebookDelete,%
4289    NotebookDirectory, NotebookFind, NotebookFindReturnObject, NotebookGet,%
4290    NotebookGetLayoutInformationPacket, NotebookGetMisspellingsPacket,%
4291    NotebookInformation, NotebookLocate, NotebookObject, NotebookOpen,%
4292    NotebookOpenReturnObject, NotebookPath, NotebookPrint, NotebookPut,%
4293    NotebookPutReturnObject, NotebookRead, NotebookResetGeneratedCells,%
4294    Notebooks, NotebookSave, NotebookSaveAs, NotebookSelection,%
4295    NotebookSetupLayoutInformationPacket, NotebooksMenu, NotebookWrite,%
4296    NotElement, NProductExtraFactors, NProductFactors, NRoots,%
4297    NSumExtraTerms, NSumTerms, NumberMarks, NumberMultiplier, NumberString,%
4298    NumericFunction, NumericQ, NValues, Offset, OLEData,%
4299    OneStepRowReduction, Open, OpenFunctionInspectorPacket,%
4300    OpenSpecialOptions, OptimizationLevel, OptionInspectorSettings,%
4301    OptionQ, OptionsPacket, OptionValueBox, OptionValueBoxOptions, Orange,%
4302    Ordering, Oscillatory, OutputAutoOverwrite, OutputFormData,%
4303    OutputGrouping, OutputMathEditExpression, OutputNamePacket,%
4304    OutputToOutputForm, OutputToStandardForm, Over, Overflow, Overlaps,%
4305    Overscript, OverscriptBox, OverscriptBoxOptions, OwnValues, PadLeft,%
4306    PadRight, PageBreakAbove, PageBreakBelow, PageBreakWithin,%
4307    PageFooterLines, PageFooters, PageHeaderLines, PageHeaders,%
4308    PalettePath, PaperWidth, ParagraphIndent, ParagraphSpacing,%
4309    ParameterVariables, ParentConnect, ParentForm, Parenthesize,%
4310    PasteBoxFormInlineCells, Path, PatternTest, PeriodicInterpolation,%
4311    Pick, Piecewise, PiecewiseExpand, Pink, Pivoting, PixelConstrained,%
4312    Placeholder, Plain, Plot3Matrix, PointForm, PolynomialForm,%
4313    PolynomialReduce, Polynomials, PowerModList, Precedence,%
4314    PreferencesPath, PreserveStyleSheet, Previous, PrimaryPlaceholder,%
4315    Primes, PrincipalValue, PrintAction, PrintingCopies, PrintingOptions,%
4316    PrintingPageRange, PrintingStartingPageNumber,%
4317    PrintingStyleEnvironment, PrintPrecision, PrivateCellOptions,%
4318    PrivateEvaluationOptions, PrivateFontOptions, PrivateNotebookOptions,%
4319    PrivatePaths, ProductLog, PromptForm, Purple, Quantile,%
4320    QuasiMonteCarlo, QuasiNewton, RadicalBox, RadicalBoxOptions,%
4321    RandomSeed, RationalFunctions, Rationals, RawData, RawMedium,%
4322    RealBlockForm, Reals, Reap, Red, Refine, Refresh, RegularExpression,%
4323    Reinstall, Release, Removed, RenderingOptions, RepeatedString,%
4324    ReplaceList, Rescale, ResetMenusPacket, Resolve, ResumePacket,%
4325    ReturnExpressionPacket, ReturnInputFormPacket, ReturnPacket,%
4326    ReturnTextPacket, Right, Root, RootReduce, RootSum, Row, RowAlignments,%
4327    RowBox, RowLines, RowMinHeight, RowsEqual, RowSpacings, RSolve,%
4328    RuleCondition, RuleForm, RulerUnits, Saveable, SaveAutoDelete,%
4329    ScreenRectangle, ScreenStyleEnvironment, ScriptBaselineShifts,%
4330    ScriptLevel, ScriptMinSize, ScriptRules, ScriptSizeMultipliers,%
4331    ScrollingOptions, ScrollPosition, Second, SectionGrouping, Selectable,%
```

94

```
4332    SelectedNotebook, Selection, SelectionAnimate, SelectionCell,%
4333    SelectionCellCreateCell, SelectionCellDefaultStyle,%
4334    SelectionCellParentStyle, SelectionCreateCell, SelectionDuplicateCell,%
4335    SelectionEvaluate, SelectionEvaluateCreateCell, SelectionMove,%
4336    SelectionSetStyle, SelectionStrategy, SendFontInformationToKernel,%
4337    SequenceHold, SequenceLimit, SeriesCoefficient, SetBoxFormNamesPacket,%
4338    SetEvaluationNotebook, SetFileLoadingContext, SetNotebookStatusLine,%
4339    SetOptionsPacket, SetSelectedNotebook, SetSpeechParametersPacket,%
4340    SetValue, ShortestMatch, ShowAutoStyles, ShowCellBracket,%
4341    ShowCellLabel, ShowCellTags, ShowClosedCellArea, ShowContents,%
4342    ShowCursorTracker, ShowGroupOpenCloseIcon, ShowPageBreaks,%
4343    ShowSelection, ShowShortBoxForm, ShowSpecialCharacters,%
4344    ShowStringCharacters, ShrinkWrapBoundingBox, SingleLetterItalics,%
4345    SingularityDepth, SingularValueDecomposition, SingularValueList,%
4346    SinhIntegral, Smaller, Socket, SolveDelayed, SoundAndGraphics, Sow,%
4347    Space, SpaceForm, SpanAdjustments, SpanCharacterRounding,%
4348    SpanLineThickness, SpanMaxSize, SpanMinSize, SpanningCharacters,%
4349    SpanSymmetric, Sparse, SparseArray, SpeakTextPacket,%
4350    SpellingDictionaries, SpellingDictionariesPath, SpellingOptions,%
4351    SpellingSuggestionsPacket, Spherical, Split, SqrtBox, SqrtBoxOptions,%
4352    StandardDeviation, StandardForm, StartingStepSize, StartOfLine,%
4353    StartOfString, StartupSound, StepMonitor, StieltjesGamma, StoppingTest,%
4354    StringCases, StringCount, StringExpression, StringFreeQ, StringQ,%
4355    StringReplaceList, StringReplacePart, StringSplit, StripBoxes,%
4356    StripWrapperBoxes, StructuredSelection, StruveH, StruveL, StyleBox,%
4357    StyleBoxAutoDelete, StyleBoxOptions, StyleData, StyleDefinitions,%
4358    StyleForm, StyleMenuListing, StyleNameDialogSettings, StylePrint,%
4359    StyleSheetPath, Subresultants, SubscriptBox, SubscriptBoxOptions,%
4360    Subsets, Subsuperscript, SubsuperscriptBox, SubsuperscriptBoxOptions,%
4361    SubtractFrom, SubValues, SugarCube, SuperscriptBox,%
4362    SuperscriptBoxOptions, SuspendPacket, SylvesterMatrix, SymbolName,%
4363    Syntax, SyntaxForm, SyntaxPacket, SystemException, SystemHelpPath,%
4364    SystemStub, Tab, TabFilling, TabSpacings, TagBox, TagBoxOptions,%
4365    TaggingRules, TagStyle, TargetFunctions, TemporaryVariable, TensorQ,%
4366    TeXSave, TextAlignment, TextBoundingBox, TextData, TextJustification,%
4367    TextLine, TextPacket, TextParagraph, TextRendering, TextStyle,%
4368    ThisLink, TimeConstraint, TimeVariable, TitleGrouping, ToBoxes,%
4369    ToColor, ToFileName, Toggle, ToggleFalse, Tolerance, TooBig, Top,%
4370    ToRadicals, Total, Tr, TraceAction, TraceInternal, TraceLevel,%
4371    TraditionalForm, TraditionalFunctionNotation, TraditionalNotation,%
4372    TraditionalOrder, TransformationFunctions, TransparentColor,%
4373    Trapezoidal, TrigExpand, TrigFactor, TrigFactorList, TrigReduce,%
4374    TrigToExp, Tuples, UnAlias, Underflow, Underoverscript,%
4375    UnderoverscriptBox, UnderoverscriptBoxOptions, Underscript,%
4376    UnderscriptBox, UnderscriptBoxOptions, UndocumentedTestFEParserPacket,%
4377    UndocumentedTestGetSelectionPacket, UnitStep, Up, URL, Using, V2Get,%
4378    Value, ValueBox, ValueBoxOptions, ValueForm, Variance, Verbatim,%
4379    Verbose, VerboseConvertToPostScriptPacket, VerifyConvergence,%
4380    VerifySolutions, Version, VersionNumber, Vertical, VerticalForm,%
4381    ViewPointSelectorSettings, Visible, VisibleCell,%
4382    WeierstrassHalfPeriods, WeierstrassInvariants, WeierstrassSigma,%
4383    WeierstrassZeta, White, Whitespace, WhitespaceCharacter,%
4384    WindowClickSelect, WindowElements, WindowFloating, WindowFrame,%
4385    WindowFrameElements, WindowMargins, WindowMovable, WindowSize,%
```

```
4386    WindowTitle, WindowToolbars, WindowWidth, WordBoundary, WordCharacter,%
4387    WynnDegree, XMLElement},%
4388  morendkeywords={$,$AddOnsDirectory,$AnimationDisplayFunction,%
4389    $AnimationFunction,%
4390    $Assumptions,$BaseDirectory,$BoxForms,$ByteOrdering,%
4391    $CharacterEncoding,$ConditionHold,$CurrentLink,$DefaultPath,%
4392    $ExportEncodings,$ExportFormats,$FormatType,$FrontEnd,%
4393    $HistoryLength,$HomeDirectory,$ImportEncodings,$ImportFormats,%
4394    $InitialDirectory,$InstallationDate,$InstallationDirectory,%
4395    $InterfaceEnvironment,%
4396    $LaunchDirectory,$LicenseExpirationDate,$LicenseID,$LicenseProcesses,%
4397    $LicenseServer,$MachineDomain,$MaxExtraPrecision,$MaxLicenseProcesses,%
4398    $MaxNumber,$MaxPiecewiseCases,$MaxPrecision,$MaxRootDegree,%
4399    $MinNumber,$MinPrecision,$NetworkLicense,$NumberMarks,%
4400    $Off,$OutputForms,$ParentLink,$ParentProcessID,%
4401    $PasswordFile,$PathnameSeparator,$PreferencesDirectory,$PrintForms,%
4402    $PrintLiteral,$ProcessID,$ProcessorType,$ProductInformation,%
4403    $ProgramName,$PSDirectDisplay,$RandomState,$RasterFunction,%
4404    $RootDirectory,$SetParentLink,$SoundDisplay,$SuppressInputFormHeads,%
4405    $SystemCharacterEncoding,$SystemID,$TemporaryPrefix,$TextStyle,%
4406    $TopDirectory,$TraceOff,$TraceOn,$TracePattern,%
4407    $TracePostAction,$TracePreAction,$UserAddOnsDirectory,$UserBaseDirectory,%
4408    $UserName,Constant,Flat,HoldAll,%
4409    HoldAllComplete,HoldFirst,HoldRest,Listable,%
4410    Locked,NHoldAll,NHoldFirst,NHoldRest,%
4411    NumericFunction,OneIdentity,Orderless,Protected,%
4412    ReadProtected,SequenceHold},%
4413 }%

4414 %%
4415 %% Mathematica definitions (c) 1999 Michael Wiese
4416 %%
4417 \lst@definelanguage[3.0]{Mathematica}[1.0]{Mathematica}%
4418   {morekeywords={Abort,AbortProtect,AbsoluteDashing,AbsolutePointSize,%
4419       AbsoluteThickness,AbsoluteTime,AccountingFormAiry,AiPrime,AiryBi,%
4420       AiryBiPrime,Alternatives,AnchoredSearch,AxesEdge,AxesOrigin,%
4421       AxesStyle,Background,BetaRegularized,BoxStyle,C,CheckAbort,%
4422       Circle,ClebschGordan,CMYKColor,ColorFunction,ColorOutput,Compile,%
4423       Compiled,CompiledFunction,ComplexExpand,ComposeList,Composition,%
4424       ConstrainedMax,ConstrainedMin,Contexts,ContextToFilename,%
4425       ContourLines,Contours,ContourShading,ContourSmoothing,%
4426       ContourStyle,CopyDirectory,CopyFile,CosIntegral,CreateDirectory,%
4427       Cuboid,Date,DeclarePackage,DefaultColor,DefaultFont,Delete,%
4428       DeleteCases,DeleteDirectory,DeleteFile,Dialog,DialogIndent,%
4429       DialogProlog,DialogSymbols,DigitQ,Directory,DirectoryStack,Disk,%
4430       Dispatch,DownValues,DSolve,Encode,Epilog,Erfc,Evaluate,%
4431       ExponentFunction,FaceGrids,FileByteCount,FileDate,FileNames,%
4432       FileType,Find,FindList,FixedPointList,FlattenAt,Fold,FoldList,%
4433       Frame,FrameLabel,FrameStyle,FrameTicks,FromCharacterCode,%
4434       FromDate,FullGraphics,FullOptions,GammaRegularized,%
4435       GaussianIntegers,GraphicsArray,GraphicsSpacing,GridLines,%
4436       GroebnerBasis,Heads,HeldPart,HomeDirectory,Hue,IgnoreCases,%
4437       InputStream,Install,InString,IntegerDigits,InterpolatingFunction,%
4438       InterpolatingPolynomial,Interpolation,Interrupt,InverseFunction,%
4439       InverseFunctions,JacobiZeta,LetterQ,LinearProgramming,ListPlay,%
```

```
4440        LogGamma,LowerCaseQ,MachineNumberQ,MantissaExponent,MapIndexed,%
4441        MapThread,MatchLocalNames,MatrixExp,MatrixPower,MeshRange,%
4442        MeshStyle,MessageList,Module,NDSolve,NSolve,NullRecords,%
4443        NullWords,NumberFormat,NumberPadding,NumberSigns,OutputStream,%
4444        PaddedForm,ParentDirectory,Pause,Play,PlayRange,PlotRegion,%
4445        PolygonIntersections,PolynomialGCD,PolynomialLCM,PolynomialMod,%
4446        PostScript,PowerExpand,PrecisionGoal,PrimePi,Prolog,%
4447        QRDecomposition,Raster,RasterArray,RealDigits,Record,RecordLists,%
4448        RecordSeparators,ReleaseHold,RenameDirectory,RenameFile,%
4449        ReplaceHeldPart,ReplacePart,ResetDirectory,Residue,%
4450        RiemannSiegelTheta,RiemannSiegelZ,RotateLabel,SameTest,%
4451        SampleDepth,SampledSoundFunction,SampledSoundList,SampleRate,%
4452        SchurDecomposition,SessionTime,SetAccuracy,SetDirectory,%
4453        SetFileDate,SetPrecision,SetStreamPosition,Shallow,SignPadding,%
4454        SinIntegral,SixJSymbol,Skip,Sound,SpellingCorrection,%
4455        SphericalRegion,Stack,StackBegin,StackComplete,StackInhibit,%
4456        StreamPosition,Streams,StringByteCount,StringConversion,%
4457        StringDrop,StringInsert,StringPosition,StringReplace,%
4458        StringReverse,StringTake,StringToStream,SurfaceColor,%
4459        SyntaxLength,SyntaxQ,TableAlignments,TableDepth,%
4460        TableDirections,TableHeadings,TableSpacing,ThreeJSymbol,TimeUsed,%
4461        TimeZone,ToCharacterCode,ToDate,ToHeldExpression,TokenWords,%
4462        ToLowerCase,ToUpperCase,Trace,TraceAbove,TraceBackward,%
4463        TraceDepth,TraceDialog,TraceForward,TraceOff,TraceOn,%
4464        TraceOriginal,TracePrint,TraceScan,Trig,Unevaluated,Uninstall,%
4465        UnsameQ,UpperCaseQ,UpValues,ViewCenter,ViewVertical,With,Word,%
4466        WordSearch,WordSeparators},%
4467    morendkeywords={Stub,Temporary,$Aborted,$BatchInput,$BatchOutput,%
4468        $CreationDate,$DefaultFont,$DumpDates,$DumpSupported,$Failed,%
4469        $Input,$Inspector,$IterationLimit,$Language,$Letters,$Linked,%
4470        $LinkSupported,$MachineEpsilon,$MachineID,$MachineName,%
4471        $MachinePrecision,$MachineType,$MaxMachineNumber,$MessageList,%
4472        $MessagePrePrint,$MinMachineNumber,$ModuleNumber,$NewMessage,%
4473        $NewSymbol,$Notebooks,$OperatingSystem,$Packages,$PipeSupported,%
4474        $PreRead,$ReleaseNumber,$SessionID,$SoundDisplayFunction,%
4475        $StringConversion,$StringOrder,$SyntaxHandler,$TimeUnit,%
4476        $VersionNumber}%
4477    }%
4478 \lst@definelanguage[1.0]{Mathematica}%
4479    {morekeywords={Abs,Accuracy,AccurayGoal,AddTo,AiryAi,AlgebraicRules,%
4480        AmbientLight,And,Apart,Append,AppendTo,Apply,ArcCos,ArcCosh,%
4481        ArcCot,ArcCoth,ArcCsc,ArcCsch,ArcSec,ArcSech,ArcSin,ArcSinh,%
4482        ArcTan,ArcTanh,Arg,ArithmeticGeometricMean,Array,AspectRatio,%
4483        AtomQ,Attributes,Axes,AxesLabel,BaseForm,Begin,BeginPackage,%
4484        BernoulliB,BesselI,BesselJ,BesselK,BesselY,Beta,Binomial,Blank,%
4485        BlankNullSequence,BlankSequence,Block,Boxed,BoxRatios,Break,Byte,%
4486        ByteCount,Cancel,Cases,Catch,Ceiling,CForm,Character,Characters,%
4487        ChebyshevT,ChebyshevU,Check,Chop,Clear,ClearAll,ClearAttributes,%
4488        ClipFill,Close,Coefficient,CoefficientList,Collect,ColumnForm,%
4489        Complement,Complex,CompoundExpression,Condition,Conjugate,%
4490        Constants,Context,Continuation,Continue,ContourGraphics,%
4491        ContourPlot,Cos,Cosh,Cot,Coth,Count,Csc,Csch,Cubics,Cyclotomic,%
4492        D,Dashing,Decompose,Decrement,Default,Definition,Denominator,%
4493        DensityGraphics,DensityPlot,Depth,Derivative,Det,DiagonalMatrix,%
```

```
4494        DigitBlock,Dimensions,DirectedInfinity,Display,DisplayFunction,%
4495        Distribute,Divide,DivideBy,Divisors,DivisorSigma,Do,Dot,Drop,Dt,%
4496        Dump,EdgeForm,Eigensystem,Eigenvalues,Eigenvectors,Eliminate,%
4497        EllipticE,EllipticExp,EllipticF,EllipticK,EllipticLog,EllipticPi,%
4498        EllipticTheta,End,EndPackage,EngineeringForm,Environment,Equal,%
4499        Erf,EulerE,EulerPhi,EvenQ,Exit,Exp,Expand,ExpandAll,%
4500        ExpandDenominator,ExpandNumerator,ExpIntegralE,ExpIntegralEi,%
4501        Exponent,Expression,ExtendedGCD,FaceForm,Factor,FactorComplete,%
4502        Factorial,Factorial2,FactorInteger,FactorList,FactorSquareFree,%
4503        FactorSquareFreeList,FactorTerms,FactorTermsList,FindMinimum,%
4504        FindRoot,First,Fit,FixedPoint,Flatten,Floor,FontForm,For,Format,%
4505        FormatType,FortranForm,Fourier,FreeQ,FullDefinition,FullForm,%
4506        Function,Gamma,GCD,GegenbauerC,General,Get,Goto,Graphics,%
4507        Graphics3D,GrayLevel,Greater,GreaterEqual,Head,HermiteH,%
4508        HiddenSurface,Hold,HoldForm,Hypergeometric0F1,Hypergeometric1F1,%
4509        Hypergeometric2F1,HypergeometricU,Identity,IdentityMatrix,If,Im,%
4510        Implies,In,Increment,Indent,Infix,Information,Inner,Input,%
4511        InputForm,InputString,Insert,Integer,IntegerQ,Integrate,%
4512        Intersection,Inverse,InverseFourier,InverseJacobiSN,%
4513        InverseSeries,JacobiAmplitude,JacobiP,JacobiSN,JacobiSymbol,Join,%
4514        Label,LaguerreL,Last,LatticeReduce,LCM,LeafCount,LegendreP,%
4515        LegendreQ,LegendreType,Length,LerchPhi,Less,LessEqual,Level,%
4516        Lighting,LightSources,Limit,Line,LinearSolve,LineBreak,List,%
4517        ListContourPlot,ListDensityPlot,ListPlot,ListPlot3D,Literal,Log,%
4518        LogicalExpand,LogIntegral,MainSolve,Map,MapAll,MapAt,MatchQ,%
4519        MatrixForm,MatrixQ,Max,MaxBend,MaxMemoryUsed,MemberQ,%
4520        MemoryConstrained,MemoryInUse,Mesh,Message,MessageName,Messages,%
4521        Min,Minors,Minus,Mod,Modulus,MoebiusMu,Multinomial,N,NameQ,Names,%
4522        NBernoulliB,Needs,Negative,Nest,NestList,NIntegrate,%
4523        NonCommutativeMultiply,NonConstants,NonNegative,Normal,Not,%
4524        NProduct,NSum,NullSpace,Number,NumberForm,NumberPoint,NumberQ,%
4525        NumberSeparator,Numerator,O,OddQ,Off,On,OpenAppend,OpenRead,%
4526        OpenTemporary,OpenWrite,Operate,Optional,Options,Or,Order,%
4527        OrderedQ,Out,Outer,OutputForm,PageHeight,PageWidth,%
4528        ParametricPlot,ParametricPlot3D,Part,Partition,PartitionsP,%
4529        PartitionsQ,Pattern,Permutations,Plot,Plot3D,PlotDivision,%
4530        PlotJoined,PlotLabel,PlotPoints,PlotRange,PlotStyle,Pochhammer,%
4531        Plus,Point,PointSize,PolyGamma,Polygon,PolyLog,PolynomialQ,%
4532        PolynomialQuotient,PolynomialRemainder,Position,Positive,Postfix,%
4533        Power,PowerMod,PrecedenceForm,Precision,PreDecrement,Prefix,%
4534        PreIncrement,Prepend,PrependTo,Prime,PrimeQ,Print,PrintForm,%
4535        Product,Protect,PseudoInverse,Put,PutAppend,Quartics,Quit,%
4536        Quotient,Random,Range,Rational,Rationalize,Raw,Re,Read,ReadList,%
4537        Real,Rectangle,Reduce,Remove,RenderAll,Repeated,RepeatedNull,%
4538        Replace,ReplaceAll,ReplaceRepeated,Rest,Resultant,Return,Reverse,%
4539        RGBColor,Roots,RotateLeft,RotateRight,Round,RowReduce,Rule,%
4540        RuleDelayed,Run,RunThrough,SameQ,Save,Scaled,Scan,ScientificForm,%
4541        Sec,Sech,SeedRandom,Select,Sequence,SequenceForm,Series,%
4542        SeriesData,Set,SetAttributes,SetDelayed,SetOptions,Shading,Share,%
4543        Short,Show,Sign,Signature,Simplify,Sin,SingularValues,Sinh,%
4544        Skeleton,Slot,SlotSequence,Solve,SolveAlways,Sort,%
4545        SphericalHarmonicY,Splice,Sqrt,StirlingS1,StirlingS2,String,%
4546        StringBreak,StringForm,StringJoin,StringLength,StringMatchQ,%
4547        StringSkeleton,Subscript,Subscripted,Subtract,SubtractForm,Sum,%
```

```
4548        Superscript,SurfaceGraphics,Switch,Symbol,Table,TableForm,TagSet,%
4549        TagSetDelayed,TagUnset,Take,Tan,Tanh,ToString,TensorRank,TeXForm,%
4550        Text,TextForm,Thickness,Thread,Through,Throw,Ticks,%
4551        TimeConstrained,Times,TimesBy,Timing,ToExpression,Together,%
4552        ToRules,ToString,TotalHeight,TotalWidth,Transpose,TreeForm,TrueQ,%
4553        Unequal,Union,Unique,Unprotect,Unset,Update,UpSet,UpSetDelayed,%
4554        ValueQ,Variables,VectorQ,ViewPoint,WeierstrassP,%
4555        WeierstrassPPrime,Which,While,WorkingPrecision,Write,WriteString,%
4556        Xor,ZeroTest,Zeta},%
4557      morendkeywords={All,Automatic,Catalan,ComplexInfinity,Constant,%
4558        Degree,E,EndOfFile,EulerGamma,False,Flat,GoldenRatio,HoldAll,%
4559        HoldFirst,HoldRest,I,Indeterminate,Infinity,Listable,Locked,%
4560        Modular,None,Null,OneIdentity,Orderless,Pi,Protected,%
4561        ReadProtected,True,$CommandLine,$Context,$ContextPath,$Display,%
4562        $DisplayFunction,$Echo,$Epilog,$IgnoreEOF,$Line,$Messages,%
4563        $Output,$Path,$Post,$Pre,$PrePrint,$RecursionLimit,$System,%
4564        $Urgent,$Version},%
4565      sensitive,%
4566      morecomment=[s]{(*}{*)},%
4567      morestring=[d]"%
4568    }[keywords,comments,strings]%

4569 ⟨/lang1⟩
```

2.44 Mercury

Dominique de Waleffe mailed me the data and Ralph Becket extended the definition.

```
4570 ⟨*lang2⟩

4571 %%
4572 %% Mercury definition (c) 1997 Dominique de Waleffe
4573 %% Extended (c) 2001 Ralph Becket
4574 %%
4575 \lst@definelanguage{Mercury}%
4576   {otherkeywords={::,->,-->,--->,:-,==,=>,<=,<=>},%
4577    morekeywords={module,include_module,import_module,interface,%
4578        end_module,implementation,mode,is,failure,semidet,nondet,det,%
4579        multi,erroneous,inst,in,out,di,uo,ui,type,typeclass,instance,%
4580        where,with_type,pred,func,lambda,impure,semipure,if,then,else,%
4581        some,all,not,true,fail,pragma,memo,no_inline,inline,loop_check,%
4582        minimal_model,fact_table,type_spec,terminates,does_not_terminate,%
4583        check_termination,promise_only_solution,unsafe_promise_unique,%
4584        source_file,obsolete,import,export,c_header_code,c_code,%
4585        foreign_code,foreign_proc,may_call_mercury,will_not_call_mercury,%
4586        thread_safe,not_thread_safe},%
4587      sensitive=t,%
4588      morecomment=[l]\%,%
4589      morecomment=[s]{/*}{*/},%
4590      morestring=[bd]",%
4591      morestring=[bd]'%
4592    }[keywords,comments,strings]%

4593 ⟨/lang2⟩
```

2.45 MetaPost

Uwe Siart provided the keywords for a previous version. The current language definition comes from Brooks Moses.

```
4594 ⟨*lang3⟩

4595 %%
4596 %% MetaPost definition (c) 2004 Brooks Moses
4597 %%   This definition is based on the language specifications
4598 %%   contained in the _User's Manual for Metapost_, with the core
4599 %%   language enhancements that are described in the _Drawing
4600 %%   Graphs with MetaPost_ documentation.
4601 %%
4602 \lst@definelanguage{MetaPost}%
4603   {% keywords[1] = MetaPost primitives (not found in following tables)
4604    morekeywords={end,begingroup,endgroup,beginfig,endfig,def,vardef,%
4605      primary,secondary,tertiary,primarydef,secondarydef,tertiarydef,%
4606      expr,suffix,text,enddef,if,fi,else,elseif,for,forsuffixes,%
4607      forever,endfor,upto,downto,stop,until,tension,controls,on,off,%
4608      btex,etex,within,input},
4609   % keywords[2] = Operators (Tables 6-9 in MetaPost User's manual)
4610    morekeywords=[2]{abs,and,angle,arclength,arctime,ASCII,bbox,bluepart,%
4611      boolean,bot,ceiling,center,char,color,cosd,cutafter,cutbefore,%
4612      cycle,decimal,dir,direction,directionpoint,directiontime,div,%
4613      dotprod,floor,fontsize,greenpart,hex,infont,intersectionpoint,%
4614      intersectiontimes,inverse,known,length,lft,llcorner,lrcorner,%
4615      makepath,makepen,mexp,mlog,mod,normaldeviate,not,numeric,oct,%
4616      odd,or,pair,path,pen,penoffset,picture,point,postcontrol,%
4617      precontrol,redpart,reverse,rotated,round,rt,scaled,shifted,%
4618      sind,slanted,sqrt,str,string,subpath,substring,top,transform,%
4619      transformed,ulcorner,uniformdeviate,unitvector,unknown,%
4620      urcorner,whatever,xpart,xscaled,xxpart,xypart,ypart,yscaled,%
4621      yxpart,yypart,zscaled,of,reflectedabout,rotatedaround,ulft,urt,%
4622      llft,lrt,readfrom,write,stroked,filled,textual,clipped,bounded,%
4623      pathpart,penpart,dashpart,textpart,fontpart},%
4624   % keywords[3] = Commands (Table 10)
4625    morekeywords=[3]{addto,clip,cutdraw,draw,drawarrow,drawdblarrow,%
4626      fill,filldraw,interim,let,loggingall,newinternal,pickup,%
4627      save,setbounds,shipout,show,showdependencies,showtoken,%
4628      showvariable,special,tracingall,tracingnone,undraw,unfill,%
4629      unfilldraw,to,also,contour,doublepath,withcolor,withpen,%
4630      dashed,randomseed},%
4631   % keywords[4] = Function-Like Macros (Table 11)
4632    morekeywords=[4]{boxit,boxjoin,bpath,buildcycle,circleit,dashpattern,%
4633      decr,dotlabel,dotlabels,drawboxed,drawboxes,drawoptions,%
4634      drawunboxed,fixpos,fixsize,incr,interpath,label,labels,max,min,pic,%
4635      thelabel,z,image},%
4636   % keywords[5] = Internal and Predefined Variables (Tables 3, 4)
4637    morekeywords=[5]{ahangle,ahlength,bboxmargin,charcode,circmargin,%
4638      day,defaultdx,defaultdy,defaultpen,defaultscale,labeloffset,%
4639      linecap,linejoin,miterlimit,month,pausing,prologues,showstopping,%
4640      time,tracingcapsules,tracingchoices,tracingcommands,%
4641      tracingequations,tracinglostchars,tracingmacros,tracingonline,%
4642      tracingoutput,tracingrestores,tracingspecs,tracingstats,%
4643      tracingtitles,truecorners,warningcheck,year},
```

```
4644    morekeywords=[5]{background,currentpen,currentpicture,cuttings,%
4645        defaultfont},%
4646    % keywords[6] = Predefined Constants (Table 5)
4647    morekeywords=[6]{beveled,black,blue,bp,butt,cc,cm,dd,ditto,down,%
4648        epsilon,evenly,false,fullcircle,green,halfcircle,identity,%
4649        in,infinity,left,mitered,mm,nullpicture,origin,pc,pencircle,%
4650        pt,quartercircle,red,right,rounded,squared,true,unitsquare,%
4651        up,white,withdots},
4652    sensitive=false,%
4653    alsoother={0123456789$},%
4654    morecomment=[l]\%,%
4655    morestring=[mf]{input\ },%
4656    morestring=[b]"%
4657  }[keywords,comments,strings,mf]%

4658 ⟨/lang3⟩
```

2.46 Miranda

Thanks to Peter Bartke for providing the definition.

```
4659 ⟨*lang2⟩

4660 %%
4661 %% Miranda definition (c) 1998 Peter Bartke
4662 %%
4663 %% Miranda: pure lazy functional language with polymorphic type system,
4664 %%          garbage collection and functions as first class citizens
4665 %%
4666 \lst@definelanguage{Miranda}%
4667   {morekeywords={abstype,div,if,mod,otherwise,readvals,show,type,where,%
4668       with,bool,char,num,sys_message,False,True,Appendfile,Closefile,%
4669       Exit,Stderr,Stdout,System,Tofile,\%include,\%export,\%free,%
4670       \%insert,abs,and,arctan,cjustify,code,concat,const,converse,cos,%
4671       decode,digit,drop,dropwhile,entier,error,exp,filemode,filter,%
4672       foldl,foldl1,foldr,foldr1,force,fst,getenv,hd,hugenum,id,index,%
4673       init,integer,iterate,last,lay,layn,letter,limit,lines,ljustify,%
4674       log,log10,map,map2,max,max2,member,merge,min,min2,mkset,neg,%
4675       numval,or,pi,postfix,product,read,rep,repeat,reverse,rjustify,%
4676       scan,seq,showfloat,shownum,showscaled,sin,snd,sort,spaces,sqrt,%
4677       subtract,sum,system,take,takewhile,tinynum,tl,transpose,undef,%
4678       until,zip2,zip3,zip4,zip5,zip6,zip},%
4679    sensitive,%
4680    morecomment=[l]||,%
4681    morestring=[b]"%
4682   }[keywords,comments,strings]%

4683 ⟨/lang2⟩
```

2.47 Mizar

As you can read below, Adam Grabowski provided this language definition.

```
4684 ⟨*lang3⟩

4685 %%
4686 %% Mizar definition (c) 2003 Adam Grabowski
```

```
4687 %%
4688 %% Mizar is freely available at URL www.mizar.org for the Linux x86,
4689 %% Solaris x86, and Windows operating systems.
4690 %%
4691 \lst@definelanguage{Mizar}%
4692   {otherkeywords={->,(\#,\#),.=),\&},%
4693   morekeywords={vocabulary,constructors,$1,$1,$2,$3,$4,$5,$6,$7,$8,%
4694       @proof,according,aggregate,and,antonym,as,associativity,assume,%
4695       asymmetry,attr,be,begin,being,by,canceled,case,cases,cluster,%
4696       clusters,coherence,commutativity,compatibility,connectedness,%
4697       consider,consistency,constructors,contradiction,correctness,def,%
4698       deffunc,define,definition,definitions,defpred,end,environ,equals,%
4699       ex,exactly,existence,for,from,func,given,hence,hereby,holds,%
4700       idempotence,if,iff,implies,involutiveness,irreflexivity,is,it,%
4701       let,means,mode,non,not,notation,now,of,or,otherwise,over,per,%
4702       pred,prefix,projectivity,proof,provided,qua,reconsider,redefine,%
4703       reflexivity,requirements,reserve,scheme,schemes,section,selector,%
4704       set,st,struct,such,suppose,symmetry,synonym,take,that,the,then,%
4705       theorem,theorems,thesis,thus,to,transitivity,uniqueness,%
4706       vocabulary,where},%
4707   sensitive=t,%
4708   morecomment=[l]::%
4709   }[keywords,comments]%
4710 ⟨/lang3⟩
```

2.48 ML

Thanks to Torben Hoffmann for providing the definition.

```
4711 ⟨*lang2⟩
```

```
4712 %%
4713 %% ML definition (c) 1999 Torben Hoffmann
4714 %%
4715 \lst@definelanguage{ML}%
4716   {morekeywords={abstype,and,andalso,as,case,do,datatype,else,end,%
4717       eqtype,exception,fn,fun,functor,handle,if,in,include,infix,%
4718       infixr,let,local,nonfix,of,op,open,orelse,raise,rec,sharing,sig,%
4719       signature,struct,structure,then,type,val,with,withtype,while},%
4720   sensitive,%
4721   morecomment=[n]{(*}{*)},%
4722   morestring=[d]"%
4723   }[keywords,comments,strings]%
4724 ⟨/lang2⟩
```

2.49 Modula-2

Took data from

- NIKLAUS WIRTH: **Programmieren in Modula-2**, Übers. Guido Pfeiffer; 2.
  Auflage – Berlin; Heidelberg; New York; London; Paris; Tokyo; Hong Kong:
  Springer, 1991; ISBN 3-540-51689-1.

```
4725 ⟨*lang3⟩
```

```
4726 \lst@definelanguage{Modula-2}%
4727   {morekeywords={AND,ARRAY,BEGIN,BY,CASE,CONST,DIV,DO,ELSE,ELSIF,END,%
4728     EXIT,EXPORT,FOR,FROM,IF,IMPLEMENTATION,IMPORT,IN,MOD,MODULE,NOT,%
4729     OF,OR,POINTER,PROCEDURE,QUALIFIED,RECORD,REPEAT,RETURN,SET,THEN,%
4730     TYPE,UNTIL,VAR,WHILE,WITH,ABS,BITSET,BOOLEAN,CAP,CARDINAL,CHAR,%
4731     CHR,DEC,EXCL,FALSE,FLOAT,HALT,HIGH,INC,INCL,INTEGER,LONGCARD,%
4732     LONGINT,LONGREAL,MAX,MIN,NIL,ODD,ORD,PROC,REAL,SIZE,TRUE,TRUNC,%
4733     VAL,DEFINITION,LOOP},% added keywords due to Peter Bartke 99/07/22
4734   sensitive,%
4735   morecomment=[n]{(*}{*)},%
4736   morestring=[d]',%
4737   morestring=[d]"%
4738   }[keywords,comments,strings]%
4739 ⟨/lang3⟩
```

2.50 MuPAD

This definition was provided by Christopher Creutzig. Again thanks to Ulrike Fischer for pointing to a missing @ in `\lstdefinelanguage`.

```
4740 ⟨∗lang3⟩
```

```
4741 \lst@definelanguage{MuPAD}{%
4742   morekeywords={end,next,break,if,then,elif,else,end_if,case,end_case,%
4743     otherwise,for,from,to,step,downto,in,end_for,while,end_while,%
4744     repeat,until,end_repeat,or,and,not,xor,div,mod,union,minus,%
4745     intersect,subset,proc,begin,end_proc,domain,end_domain,category,%
4746     end_category,axiom,end_axiom,quit,delete,frame},%
4747   morekeywords=[2]{NIL,FAIL,TRUE,FALSE,UNKNOWN,I,RD_INF,RD_NINF,%
4748     RD_NAN,name,local,option,save,inherits,of,do},%
4749   otherkeywords={\%if,?,!,:=,<,>,=,<=,<>,>=,==>,<=>,::,..,...,->,%
4750     @,@@,\$},%
4751   sensitive=true,%
4752   morecomment=[l]{//},%
4753   morecomment=[n]{/*}{*/},%
4754   morestring=[b]",%
4755   morestring=[d]{`}%
4756   }[keywords,comments,strings]
```

```
4757 ⟨/lang3⟩
```

2.51 NASTRAN

```
4758 ⟨∗lang3⟩
```

The definition is from Jeffrey Ratcliffe—except the `MoreSelectCharTable` part which simulates the keyword `BEGIN BULK`.

```
4759 \lst@definelanguage{NASTRAN}
4760   {morekeywords={ENDDATA},%
4761   morecomment=[l]$,%
4762   MoreSelectCharTable=%
4763       \lst@CArgX BEGIN\ BULK\relax\lst@CDef{}%
4764       {\lst@ifmode\else \ifnum\lst@length=\z@
4765           \lst@EnterMode{\lst@GPmode}{\lst@modetrue
4766               \let\lst@currstyle\lst@gkeywords@sty}%
4767       \fi \fi}%
```

```
4768        {\ifnum\lst@mode=\lst@GPmode
4769            \lst@XPrintToken \lst@LeaveMode
4770        \fi}%
4771    }[keywords,comments]%
```

4772 ⟨/lang3⟩

2.52 Oberon-2

4773 ⟨∗lang3⟩

```
4774 \lst@definelanguage{Oberon-2}%
4775    {morekeywords={ARRAY,BEGIN,BOOLEAN,BY,CASE,CHAR,CONST,DIV,DO,ELSE,%
4776        ELSIF,END,EXIT,FALSE,FOR,IF,IMPORT,IN,INTEGER,IS,LONGINT,%
4777        LONGREAL,LOOP,MOD,MODULE,NIL,OF,OR,POINTER,PROCEDURE,REAL,RECORD,%
4778        REPEAT,RETURN,SET,SHORTINT,THEN,TO,TRUE,TYPE,UNTIL,VAR,WHILE,%
4779        WITH,ABS,ASH,CAP,CHR,COPY,DEC,ENTIER,EXCL,HALT,INC,INCL,LEN,LONG,%
4780        MAX,MIN,NEW,ODD,ORD,SHORT,SIZE},%
4781    sensitive,%
4782    morecomment=[n]{(*}{*)},%
4783    morestring=[d]',%
4784    morestring=[d]"%
4785    }[keywords,comments,strings]%
```

4786 ⟨/lang3⟩

2.53 OCL

This definition is based on chapter 7 of the OMG UML standard version 1.3:

- OMG: **OMG Unified Modeling Language Specification**; © 1999 OMG;
  Available at `ftp://ftp.omg.org/pub/docs/ad/99-06-08.pdf`.

This language is due to Achim D. Brucker.

4787 ⟨∗lang3⟩

```
4788 %%
4789 %% OCL definition (c) 2000 Achim D. Brucker
4790 %%
4791 %% You are allowed to use, modify and distribute this code either under
4792 %% the terms of the LPPL (version 1.0 or later) or the GPL (version 2.0
4793 %% or later).
4794 %%
```

First we define are very decorative style. In the OMG standard only the boolean (infix (?)) operations are highlighted, but I think all OCL-defined operations should be highlighted, because they are *guaranteed* to be side-effect-free (in OCL only side effect free evaluations or path expressions are allowed).

```
4795 \lst@definelanguage[decorative]{OCL}[OMG]{OCL}
4796    {otherkeywords={@pre},%
4797    morendkeywords={name,attributes,associatoinEnds,operations,%
4798        supertypes,allSupertypes,allInstances,oclIsKindOf,oclIsTypeOf,%
4799        oclAsType,oclInState,oclIsNew,evaluationType,abs,floor,round,max,%
4800        min,div,mod,size,concat,toUpper,toLower,substring,includes,%
4801        excludes,count,includesAll,exludesAll,isEmpty,notEmpty,sum,%
4802        exists,forAll,isUnique,sortedBy,iterate,union,intersection,%
4803        including,excluding,symmetricDifference,select,reject,collect,%
4804        asSequence,asBag,asSequence,asSet,append,prepend,subSequence,at,%
```

```
4805        first,last,true,false,isQuery}%
4806    }%
```

Remark: "isQuery" is not real OCL, but a important attribute of the underlying UML model.

The dialect called `OMG` is a very spare version. If you use this variant with bold style for first and second order keywords you get the look and feel of the OMG standard. First order keywords are the OCL context declarations (see section 7.3 of the OMG standard):

```
4807 \lst@definelanguage[OMG]{OCL}%
4808     {morekeywords={context,pre,inv,post},%
```

Second order keywords are the operation which are defined for type Boolean (see pages 7-34/35 of the OMG standard) and the let-operation (in principle these are the infix operations):

```
4809        ndkeywords={or,xor,and,not,implies,if,then,else,endif},%
```

Third order keywords are the basic data types as declared in section 7.4 of the OMG standard:

```
4810        morekeywords=[3]{Boolean,Integer,Real,String,Set,Sequence,Bag,%
4811            OclType,OclAny,OclExpression,Enumeration,Collection,},%
4812        sensitive=t,%
4813        morecomment=[l]--,%
4814        morestring=[d]'%
4815    }[keywords,comments,strings]%
```

After a bug report by Martin Süßkraut `morerdkeywords` has been changed to the correct optional argument [3].

```
4816 ⟨/lang3⟩
```

2.54 Octave

```
4817 ⟨∗lang1⟩
```

As you can read below the definition is due to Ulrich G. Wortmann. Additions due to Sebastian Schubert.

```
4818 %%
4819 %% Octave definition (c) 2001,2002 Ulrich G. Wortmann
4820 %%
4821 \lst@definelanguage{Octave}%
4822    {morekeywords={gt,lt,amp,abs,acos,acosh,acot,acoth,acsc,acsch,%
4823        all,angle,ans,any,asec,asech,asin,asinh,atan,atan2,atanh,auread,%
4824        auwrite,axes,axis,balance,bar,bessel,besselk,bessely,beta,%
4825        betainc,betaln,blanks,bone,break,brighten,capture,cart2pol,%
4826        cart2sph,caxis,cd,cdf2rdf,cedit,ceil,chol,cla,clabel,clc,clear,%
4827        clf,clock,close,colmmd,Colon,colorbar,colormap,ColorSpec,colperm,%
4828        comet,comet3,compan,compass,computer,cond,condest,conj,contour,%
4829        contour3,contourc,contrast,conv,conv2,cool,copper,corrcoef,cos,%
4830        cosh,cot,coth,cov,cplxpair,cputime,cross,csc,csch,csvread,%
4831        csvwrite,cumprod,cumsum,cylinder,date,dbclear,dbcont,dbdown,%
4832        dbquit,dbstack,dbstatus,dbstep,dbstop,dbtype,dbup,ddeadv,ddeexec,%
4833        ddeinit,ddepoke,ddereq,ddeterm,ddeunadv,deblank,dec2hex,deconv,%
4834        del2,delete,demo,det,diag,diary,diff,diffuse,dir,disp,dlmread,%
4835        dlmwrite,dmperm,dot,drawnow,echo,eig,ellipj,ellipke,else,elseif,%
4836        end,engClose,engEvalString,engGetFull,engGetMatrix,engOpen,%
```

```
4837        engOutputBuffer,engPutFull,engPutMatrix,engSetEvalCallback,%
4838        engSetEvalTimeout,engWinInit,eps,erf,erfc,erfcx,erfinv,%
4839        errorbar,etime,etree,eval,exist,exp,expint,expm,expo,eye,fclose,%
4840        feather,feof,ferror,feval,fft,fft2,fftshift,fgetl,fgets,figure,%
4841        fill,fill3,filter,filter2,find,findstr,finite,fix,flag,fliplr,%
4842        flipud,floor,flops,fmin,fmins,fopen,for,format,fplot,fprintf,%
4843        fread,frewind,fscanf,fseek,ftell,full,function,funm,fwrite,fzero,%
4844        gallery,gamma,gammainc,gammaln,gca,gcd,gcf,gco,get,getenv,%
4845        getframe,ginput,global,gplot,gradient,gray,graymon,grid,griddata,%
4846        gtext,hadamard,hankel,help,hess,hex2dec,hex2num,hidden,hilb,hist,%
4847        hold,home,hostid,hot,hsv,hsv2rgb,if,ifft,ifft2,imag,image,%
4848        imagesc,Inf,info,input,int2str,interp1,interp2,interpft,inv,%
4849        invhilb,isempty,isglobal,ishold,isieee,isinf,isletter,isnan,%
4850        isreal,isspace,issparse,isstr,jet,keyboard,kron,lasterr,lcm,%
4851        legend,legendre,length,lin2mu,line,linspace,load,log,log10,log2,%
4852        loglog,logm,logspace,lookfor,lower,ls,lscov,lu,magic,matClose,%
4853        matDeleteMatrix,matGetDir,matGetFp,matGetFull,matGetMatrix,%
4854        matGetNextMatrix,matGetString,matlabrc,matlabroot,matOpen,%
4855        matPutFull,matPutMatrix,matPutString,max,mean,median,menu,mesh,%
4856        meshc,meshgrid,meshz,mexAtExit,mexCallMATLAB,mexdebug,%
4857        mexErrMsgTxt,mexEvalString,mexFunction,mexGetFull,mexGetMatrix,%
4858        mexGetMatrixPtr,mexPrintf,mexPutFull,mexPutMatrix,mexSetTrapFlag,%
4859        min,more,movie,moviein,mu2lin,mxCalloc,mxCopyCharacterToPtr,%
4860        mxCopyComplex16ToPtr,mxCopyInteger4ToPtr,mxCopyPtrToCharacter,%
4861        mxCopyPtrToComplex16,mxCopyPtrToInteger4,mxCopyPtrToReal8,%
4862        mxCopyReal8ToPtr,mxCreateFull,mxCreateSparse,mxCreateString,%
4863        mxFree,mxFreeMatrix,mxGetIr,mxGetJc,mxGetM,mxGetN,mxGetName,%
4864        mxGetNzmax,mxGetPi,mxGetPr,mxGetScalar,mxGetString,mxIsComplex,%
4865        mxIsFull,mxIsNumeric,mxIsSparse,mxIsString,mxIsTypeDouble,%
4866        mxSetIr,mxSetJc,mxSetM,mxSetN,mxSetName,mxSetNzmax,mxSetPi,%
4867        mxSetPr,NaN,nargchk,nargin,nargout,newplot,nextpow2,nnls,nnz,%
4868        nonzeros,norm,normest,null,num2str,nzmax,ode23,ode45,orient,orth,%
4869        pack,pascal,patch,path,pause,pcolor,pi,pink,pinv,plot,plot3,%
4870        pol2cart,polar,poly,polyder,polyeig,polyfit,polyval,polyvalm,%
4871        pow2,print,printopt,prism,prod,pwd,qr,qrdelete,qrinsert,quad,%
4872        quad8,quit,quiver,qz,rand,randn,randperm,rank,rat,rats,rbbox,%
4873        rcond,real,realmax,realmin,refresh,rem,reset,reshape,residue,%
4874        return,rgb2hsv,rgbplot,rootobject,roots,rose,rosser,rot90,rotate,%
4875        round,rref,rrefmovie,rsf2csf,save,saxis,schur,sec,sech,semilogx,%
4876        semilogy,set,setstr,shading,sign,sin,sinh,size,slice,sort,sound,%
4877        spalloc,sparse,spaugment,spconvert,spdiags,specular,speye,spfun,%
4878        sph2cart,sphere,spinmap,spline,spones,spparms,sprandn,sprandsym,%
4879        sprank,sprintf,spy,sqrt,sqrtm,sscanf,stairs,startup,std,stem,%
4880        str2mat,str2num,strcmp,strings,strrep,strtok,subplot,subscribe,%
4881        subspace,sum,surf,surface,surfc,surfl,surfnorm,svd,symbfact,%
4882        symmmd,symrcm,tan,tanh,tempdir,tempname,terminal,text,tic,title,%
4883        toc,toeplitz,trace,trapz,tril,triu,type,uicontrol,uigetfile,%
4884        uimenu,uiputfile,unix,unwrap,upper,vander,ver,version,view,%
4885        viewmtx,waitforbuttonpress,waterfall,wavread,wavwrite,what,%
4886        whatsnew,which,while,white,whitebg,who,whos,wilkinson,wk1read,%
4887        stderr,stdout,plot,set,endif,wk1write,xlabel,xor,ylabel,zeros,%
4888        zlabel,zoom,endwhile,endfunction,printf,case,switch,otherwise,%
4889        system,lsode,endfor,error,ones,oneplot,__gnuplot_set__,do,until},%
4890   sensitive=t,%
```

```
4891    morecomment=[l]\#,%
4892    morecomment=[l]\#\#,%
4893    morecomment=[l]\%,%
4894    morestring=[m]',%
4895    morestring=[m]"%
4896  }[keywords,comments,strings]%
```
4897 ⟨/lang1⟩

2.55 Oz

4898 ⟨*lang2⟩

Thanks to Andres Becerra Sandoval for providing this language definition.
```
4899 %%
4900 %% Oz definition (c) Andres Becerra Sandoval
4901 %%
4902 \lst@definelanguage{Oz}%
4903   {morekeywords={andthen,at,attr,case,catch,choice,class,%
4904       cond,declare,define,dis,div,else,elsecase,%
4905       elseif,end,export,fail,false,feat,finally,%
4906       from,fun,functor,if,import,in,local,%
4907       lock,meth,mod,not,of,or,orelse,%
4908       prepare,proc,prop,raise,require,self,skip,%
4909       then,thread,true,try,unit},%
4910   sensitive=true,%
4911   morecomment=[l]{\%},%
4912   morecomment=[s]{/*}{*/},%
4913   morestring=[b]",%
4914   morestring=[d]'%
4915  }[keywords,comments,strings]%
```
4916 ⟨/lang2⟩

2.56 Pascal

4917 ⟨*lang1⟩

Thanks to Andreas Stephan for reporting non-keywords alpha, byte, pack and unpack.
```
4918 \lst@definelanguage[XSC]{Pascal}[Standard]{Pascal}
4919   {deletekeywords={alfa,byte,pack,unpack},% 1998 Andreas Stephan
4920   morekeywords={dynamic,external,forward,global,module,nil,operator,%
4921       priority,sum,type,use,dispose,mark,page,release,cimatrix,%
4922       cinterval,civector,cmatrix,complex,cvector,dotprecision,imatrix,%
4923       interval,ivector,rmatrix,rvector,string,im,inf,re,sup,chr,comp,%
4924       eof,eoln,expo,image,ival,lb,lbound,length,loc,mant,maxlength,odd,%
4925       ord,pos,pred,round,rval,sign,substring,succ,trunc,ub,ubound}%
4926  }%
4927 \lst@definelanguage[Borland6]{Pascal}[Standard]{Pascal}
4928   {morekeywords={asm,constructor,destructor,implementation,inline,%
4929       interface,nil,object,shl,shr,string,unit,uses,xor},%
4930   morendkeywords={Abs,Addr,ArcTan,Chr,Concat,Copy,Cos,CSeg,DiskFree,%
4931       DiskSize,DosExitCode,DosVersion,DSeg,EnvCount,EnvStr,Eof,Eoln,%
4932       Exp,FExpand,FilePos,FileSize,Frac,FSearch,GetBkColor,GetColor,%
4933       GetDefaultPalette,GetDriverName,GetEnv,GetGraphMode,GetMaxMode,%
4934       GetMaxX,GetMaxY,GetModeName,GetPaletteSize,GetPixel,GetX,GetY,%
4935       GraphErrorMsg,GraphResult,Hi,ImageSize,InstallUserDriver,%
```

```
4936        InstallUserFont,Int,IOResult,KeyPressed,Length,Lo,MaxAvail,%
4937        MemAvail,MsDos,Odd,Ofs,Ord,OvrGetBuf,OvrGetRetry,ParamCount,%
4938        ParamStr,Pi,Pos,Pred,Ptr,Random,ReadKey,Round,SeekEof,SeekEoln,%
4939        Seg,SetAspectRatio,Sin,SizeOf,Sound,SPtr,Sqr,Sqrt,SSeg,Succ,%
4940        Swap,TextHeight,TextWidth,Trunc,TypeOf,UpCase,WhereX,WhereY,%
4941        Append,Arc,Assign,AssignCrt,Bar,Bar3D,BlockRead,BlockWrite,ChDir,%
4942        Circle,ClearDevice,ClearViewPort,Close,CloseGraph,ClrEol,ClrScr,%
4943        Dec,Delay,Delete,DelLine,DetectGraph,Dispose,DrawPoly,Ellipse,%
4944        Erase,Exec,Exit,FillChar,FillEllipse,FillPoly,FindFirst,FindNext,%
4945        FloodFill,Flush,FreeMem,FSplit,GetArcCoords,GetAspectRatio,%
4946        GetDate,GetDefaultPalette,GetDir,GetCBreak,GetFAttr,%
4947        GetFillSettings,GetFTime,GetImage,GetIntVec,GetLineSettings,%
4948        GetMem,GetPalette,GetTextSettings,GetTime,GetVerify,%
4949        GetViewSettings,GoToXY,Halt,HighVideo,Inc,InitGraph,Insert,%
4950        InsLine,Intr,Keep,Line,LineRel,LineTo,LowVideo,Mark,MkDir,Move,%
4951        MoveRel,MoveTo,MsDos,New,NormVideo,NoSound,OutText,OutTextXY,%
4952        OvrClearBuf,OvrInit,OvrInitEMS,OvrSetBuf,PackTime,PieSlice,%
4953        PutImage,PutPixel,Randomize,Rectangle,Release,Rename,%
4954        RestoreCrtMode,RmDir,RunError,Sector,Seek,SetActivePage,%
4955        SetAllPalette,SetBkColor,SetCBreak,SetColor,SetDate,SetFAttr,%
4956        SetFillPattern,SetFillStyle,SetFTime,SetGraphBufSize,%
4957        SetGraphMode,SetIntVec,SetLineStyle,SetPalette,SetRGBPalette,%
4958        SetTextBuf,SetTextJustify,SetTextStyle,SetTime,SetUserCharSize,%
4959        SetVerify,SetViewPort,SetVisualPage,SetWriteMode,Sound,Str,%
4960        SwapVectors,TextBackground,TextColor,TextMode,Truncate,%
4961        UnpackTime,Val,Window}%
4962     }%

4963 \lst@definelanguage[Standard]{Pascal}%
4964    {morekeywords={alfa,and,array,begin,boolean,byte,case,char,const,div,%
4965        do,downto,else,end,false,file,for,function,get,goto,if,in,%
4966        integer,label,maxint,mod,new,not,of,or,pack,packed,page,program,%
4967        put,procedure,read,readln,real,record,repeat,reset,rewrite,set,%
4968        text,then,to,true,type,unpack,until,var,while,with,write,%
4969        writeln},%
4970     sensitive=f,%
4971     morecomment=[s]{(*}{*)},%
4972     morecomment=[s]{\{}{\}},%
4973     morestring=[d]'%
4974    }[keywords,comments,strings]%

4975 ⟨/lang1⟩
```

2.57 Perl

I got the data from `http://www.perl.com`. But I wish to thank Herbert Wein-
handl for the book 'Learning Perl'.

```
4976 ⟨*lang1⟩

4977 \lst@definelanguage{Perl}%
4978    {morekeywords={abs,accept,alarm,atan2,bind,binmode,bless,caller,%
4979        chdir,chmod,chomp,chop,chown,chr,chroot,close,closedir,connect,%
4980        continue,cos,crypt,dbmclose,dbmopen,defined,delete,die,do,dump,%
4981        each,else,elsif,endgrent,endhostent,endnetent,endprotoent,%
4982        endpwent,endservent,eof,eval,exec,exists,exit,exp,fcntl,fileno,%
4983        flock,for,foreach,fork,format,formline,getc,getgrent,getgrgid,%
```

```
4984        getgrnam,gethostbyaddr,gethostbyname,gethostent,getlogin,%
4985        getnetbyaddr,getnetbyname,getnetent,getpeername,getpgrp,%
4986        getppid,getpriority,getprotobyname,getprotobynumber,getprotoent,%
4987        getpwent,getpwnam,getpwuid,getservbyname,getservbyport,%
4988        getservent,getsockname,getsockopt,glob,gmtime,goto,grep,hex,if,%
4989        import,index,int,ioctl,join,keys,kill,last,lc,lcfirst,length,%
4990        link,listen,local,localtime,log,lstat,m,map,mkdir,msgctl,msgget,%
4991        msgrcv,msgsnd,my,next,no,oct,open,opendir,ord,pack,package,pipe,%
4992        pop,pos,print,printf,prototype,push,q,qq,quotemeta,qw,qx,rand,%
4993        read,readdir,readlink,recv,redo,ref,rename,require,reset,return,%
4994        reverse,rewinddir,rindex,rmdir,s,scalar,seek,seekdir,select,%
4995        semctl,semget,semop,send,setgrent,sethostent,setnetent,setpgrp,%
4996        setpriority,setprotoent,setpwent,setservent,setsockopt,shift,%
4997        shmctl,shmget,shmread,shmwrite,shutdown,sin,sleep,socket,%
4998        socketpair,sort,splice,split,sprintf,sqrt,srand,stat,study,sub,%
4999        substr,symlink,syscall,sysopen,sysread,system,syswrite,tell,%
5000        telldir,tie,tied,time,times,tr,truncate,uc,ucfirst,umask,undef,%
5001        unless,unlink,unpack,unshift,untie,until,use,utime,values,vec,%
5002        wait,waitpid,wantarray,warn,while,write,y},%
5003     sensitive,%
5004     morecomment=[l]\#,%
5005     morestring=[b]",%
5006     morestring=[b]',%
5007     MoreSelectCharTable=%
5008         \lst@ReplaceInput{\$\#}{\lst@ProcessOther\$\lst@ProcessOther\#}%
5009     }[keywords,comments,strings]%

5010  ⟨/lang1⟩
```

2.58 PHP

Luca Balzerani sent me this language definition.

```
5011  ⟨∗lang2⟩

5012  %%
5013  %% PHP definition by Luca Balzerani
5014  %%
5015  \lst@definelanguage{PHP}%
5016    {morekeywords={%
5017    %--- core language
5018      <?,?>,::,break,case,continue,default,do,else,%
5019      elseif,for,foreach,if,include,require,phpinfo,%
5020      switch,while,false,FALSE,true,TRUE,%
5021    %--- apache functions
5022      apache_lookup_uri,apache_note,ascii2ebcdic,ebcdic2ascii,%
5023      virtual,apache_child_terminate,apache_setenv,%
5024    %--- array functions
5025      array,array_change_key_case,array_chunk,array_count_values,%
5026      array_filter,array_flip,array_fill,array_intersect,%
5027      array_keys,array_map,array_merge,array_merge_recursive,%
5028      array_pad,array_pop,array_push,array_rand,array_reverse,%
5029      array_shift,array_slice,array_splice,array_sum,array_unique,%
5030      array_values,array_walk,arsort,asort,compact,count,current,each,%
5031      extract,in_array,array_search,key,krsort,ksort,list,natsort,%
5032      next,pos,prev,range,reset,rsort,shuffle,sizeof,sort,uasort,%
```

```
5033    usort,%
5034    %--- aspell functions
5035    aspell_new,aspell_check,aspell_check_raw,aspell_suggest,%
5036    %--- bc functions
5037    bcadd,bccomp,bcdiv,bcmod,bcmul,bcpow,bcscale,bcsqrt,bcsub,%
5038    %--- bzip2 functions
5039    bzclose,bzcompress,bzdecompress,bzerrno,bzerror,bzerrstr,%
5040    bzopen,bzread,bzwrite,%
5041    %--- calendar functions
5042    JDToGregorian,GregorianToJD,JDToJulian,JulianToJD,JDToJewish,%
5043    JDToFrench,FrenchToJD,JDMonthName,JDDayOfWeek,easter_date,%
5044    unixtojd,jdtounix,cal_days_in_month,cal_to_jd,cal_from_jd,%
5045    %--- ccvs functions
5046    ccvs_init,ccvs_done,ccvs_new,ccvs_add,ccvs_delete,ccvs_auth,%
5047    ccvs_reverse,ccvs_sale,ccvs_void,ccvs_status,ccvs_count,%
5048    ccvs_report,ccvs_command,ccvs_textvalue,%
5049    %--- classobj functions
5050    call_user_method,call_user_method_array,class_exists,get_class,%
5051    get_class_vars,get_declared_classes,get_object_vars,%
5052    is_a,is_subclass_of,method_exists,%
5053    %--- com functions
5054    COM,VARIANT,com_load,com_invoke,com_propget,com_get,com_propput,%
5055    com_set,com_addref,com_release,com_isenum,com_load_typelib,%
5056    %--- cpdf functions
5057    cpdf_add_annotation,cpdf_add_outline,cpdf_arc,cpdf_begin_text,%
5058    cpdf_clip,cpdf_close,cpdf_closepath,cpdf_closepath_fill_stroke,%
5059    cpdf_continue_text,cpdf_curveto,cpdf_end_text,cpdf_fill,%
5060    cpdf_finalize,cpdf_finalize_page,%
5061    cpdf_import_jpeg,cpdf_lineto,cpdf_moveto,cpdf_newpath,cpdf_open,%
5062    cpdf_page_init,cpdf_place_inline_image,cpdf_rect,cpdf_restore,%
5063    cpdf_rmoveto,cpdf_rotate,cpdf_rotate_text,cpdf_save,%
5064    cpdf_scale,cpdf_set_char_spacing,cpdf_set_creator,%
5065    cpdf_set_font,cpdf_set_horiz_scaling,cpdf_set_keywords,%
5066    cpdf_set_page_animation,cpdf_set_subject,cpdf_set_text_matrix,%
5067    cpdf_set_text_rendering,cpdf_set_text_rise,cpdf_set_title,%
5068    cpdf_setdash,cpdf_setflat,cpdf_setgray,cpdf_setgray_fill,%
5069    cpdf_setlinecap,cpdf_setlinejoin,cpdf_setlinewidth,%
5070    cpdf_setrgbcolor,cpdf_setrgbcolor_fill,cpdf_setrgbcolor_stroke,%
5071    cpdf_show_xy,cpdf_stringwidth,cpdf_set_font_directories,%
5072    cpdf_set_viewer_preferences,cpdf_stroke,cpdf_text,%
5073    cpdf_set_action_url,%
5074    %--- crack functions
5075    crack_opendict,crack_closedict,crack_check,crack_getlastmessage,%
5076    %--- ctype functions
5077    ctype_alnum,ctype_alpha,ctype_cntrl,ctype_digit,ctype_lower,%
5078    ctype_print,ctype_punct,ctype_space,ctype_upper,ctype_xdigit,%
5079    %--- curl functions
5080    curl_init,curl_setopt,curl_exec,curl_close,curl_version,%
5081    curl_error,curl_getinfo,%
5082    %--- cybercash functions
5083    cybercash_encr,cybercash_decr,cybercash_base64_encode,%
5084    %--- cybermut functions
5085    cybermut_creerformulairecm,cybermut_testmac,%
5086    %--- cyrus functions
```

```
5087    cyrus_connect,cyrus_authenticate,cyrus_bind,cyrus_unbind,%
5088    cyrus_close,%
5089  %--- datetime functions
5090    checkdate,date,getdate,gettimeofday,gmdate,gmmktime,gmstrftime,%
5091    microtime,mktime,strftime,time,strtotime,%
5092  %--- dbase functions
5093    dbase_create,dbase_open,dbase_close,dbase_pack,dbase_add_record,%
5094    dbase_delete_record,dbase_get_record,%
5095    dbase_numfields,dbase_numrecords,%
5096  %--- dba functions
5097    dba_close,dba_delete,dba_exists,dba_fetch,dba_firstkey,%
5098    dba_nextkey,dba_popen,dba_open,dba_optimize,dba_replace,%
5099  %--- dbm functions
5100    dbmopen,dbmclose,dbmexists,dbmfetch,dbminsert,dbmreplace,%
5101    dbmfirstkey,dbmnextkey,dblist,%
5102  %--- dbx functions
5103    dbx_close,dbx_connect,dbx_error,dbx_query,dbx_sort,dbx_compare,%
5104  %--- dio functions
5105    dio_open,dio_read,dio_write,dio_truncate,dio_stat,dio_seek,%
5106    dio_close,%
5107  %--- dir functions
5108    chroot,chdir,dir,closedir,getcwd,opendir,readdir,rewinddir,%
5109  %--- dotnet functions
5110    dotnet_load,%
5111  %--- errorfunc functions
5112    error_log,error_reporting,restore_error_handler,%
5113    trigger_error,user_error,%
5114  %--- exec functions
5115    escapeshellarg,escapeshellcmd,exec,passthru,system,shell_exec,%
5116  %--- fbsql functions
5117    fbsql_affected_rows,fbsql_autocommit,fbsql_change_user,%
5118    fbsql_commit,fbsql_connect,fbsql_create_db,fbsql_create_blob,%
5119    fbsql_database_password,fbsql_data_seek,fbsql_db_query,%
5120    fbsql_drop_db,fbsql_errno,fbsql_error,fbsql_fetch_array,%
5121    fbsql_fetch_field,fbsql_fetch_lengths,fbsql_fetch_object,%
5122    fbsql_field_flags,fbsql_field_name,fbsql_field_len,%
5123    fbsql_field_table,fbsql_field_type,fbsql_free_result,%
5124    fbsql_list_dbs,fbsql_list_fields,fbsql_list_tables,%
5125    fbsql_num_fields,fbsql_num_rows,fbsql_pconnect,fbsql_query,%
5126    fbsql_read_clob,fbsql_result,fbsql_rollback,fbsql_set_lob_mode,%
5127    fbsql_start_db,fbsql_stop_db,fbsql_tablename,fbsql_warnings,%
5128    fbsql_get_autostart_info,fbsql_hostname,fbsql_password,%
5129    fbsql_username,%
5130  %--- fdf functions
5131    fdf_open,fdf_close,fdf_create,fdf_save,fdf_get_value,%
5132    fdf_next_field_name,fdf_set_ap,fdf_set_status,fdf_get_status,%
5133    fdf_get_file,fdf_set_flags,fdf_set_opt,%
5134    fdf_set_javascript_action,fdf_set_encoding,fdf_add_template,%
5135  %--- filepro functions
5136    filepro,filepro_fieldname,filepro_fieldtype,filepro_fieldwidth,%
5137    filepro_fieldcount,filepro_rowcount,%
5138  %--- filesystem functions
5139    basename,chgrp,chmod,chown,clearstatcache,copy,delete,dirname,%
5140    diskfreespace,disk_total_space,fclose,feof,fflush,fgetc,fgetcsv,%
```

111

```
5141    fgetss,file_get_contents,file,file_exists,fileatime,filectime,%
5142    fileinode,filemtime,fileowner,fileperms,filesize,filetype,flock,%
5143    fopen,fpassthru,fputs,fread,fscanf,fseek,fstat,ftell,ftruncate,%
5144    set_file_buffer,is_dir,is_executable,is_file,is_link,%
5145    is_writable,is_writeable,is_uploaded_file,link,linkinfo,mkdir,%
5146    parse_ini_file,pathinfo,pclose,popen,readfile,readlink,rename,%
5147    rmdir,stat,lstat,realpath,symlink,tempnam,tmpfile,touch,umask,%
5148 %--- fribidi functions
5149    fribidi_log2vis,%
5150 %--- ftp functions
5151    ftp_connect,ftp_login,ftp_pwd,ftp_cdup,ftp_chdir,ftp_mkdir,%
5152    ftp_nlist,ftp_rawlist,ftp_systype,ftp_pasv,ftp_get,ftp_fget,%
5153    ftp_fput,ftp_size,ftp_mdtm,ftp_rename,ftp_delete,ftp_site,%
5154    ftp_quit,ftp_exec,ftp_set_option,ftp_get_option,%
5155 %--- funchand functions
5156    call_user_func_array,call_user_func,create_function,%
5157    func_get_args,func_num_args,function_exists,%
5158    register_shutdown_function,register_tick_function,%
5159 %--- gettext functions
5160    bindtextdomain,bind_textdomain_codeset,dcgettext,dcngettext,%
5161    dngettext,gettext,ngettext,textdomain,%
5162 %--- gmp functions
5163    gmp_init,gmp_intval,gmp_strval,gmp_add,gmp_sub,gmp_mul,%
5164    gmp_div_r,gmp_div_qr,gmp_div,gmp_mod,gmp_divexact,gmp_cmp,%
5165    gmp_com,gmp_abs,gmp_sign,gmp_fact,gmp_sqrt,gmp_sqrtrm,%
5166    gmp_pow,gmp_powm,gmp_prob_prime,gmp_gcd,gmp_gcdext,gmp_invert,%
5167    gmp_jacobi,gmp_random,gmp_and,gmp_or,gmp_xor,gmp_setbit,%
5168    gmp_scan0,gmp_scan1,gmp_popcount,gmp_hamdist,%
5169 %--- http functions
5170    header,headers_sent,setcookie,%
5171 %--- hw functions
5172   hw_Array2Objrec,hw_Children,hw_ChildrenObj,hw_Close,hw_Connect,%
5173   hw_Deleteobject,hw_DocByAnchor,hw_DocByAnchorObj,%
5174   hw_Document_BodyTag,hw_Document_Content,hw_Document_SetContent,%
5175   hw_ErrorMsg,hw_EditText,hw_Error,hw_Free_Document,hw_GetParents,%
5176   hw_GetChildColl,hw_GetChildCollObj,hw_GetRemote,%
5177   hw_GetSrcByDestObj,hw_GetObject,hw_GetAndLock,hw_GetText,%
5178   hw_GetObjectByQueryObj,hw_GetObjectByQueryColl,%
5179   hw_GetChildDocColl,hw_GetChildDocCollObj,hw_GetAnchors,%
5180   hw_Mv,hw_Identify,hw_InCollections,hw_Info,hw_InsColl,hw_InsDoc,%
5181   hw_InsertObject,hw_mapid,hw_Modifyobject,hw_New_Document,%
5182   hw_Output_Document,hw_pConnect,hw_PipeDocument,hw_Root,%
5183   hw_Who,hw_getusername,hw_stat,hw_setlinkroot,hw_connection_info,%
5184   hw_insertanchors,hw_getrellink,hw_changeobject,%
5185 %--- ibase functions
5186    ibase_connect,ibase_pconnect,ibase_close,ibase_query,%
5187    ibase_fetch_row,ibase_fetch_object,ibase_field_info,%
5188    ibase_free_result,ibase_prepare,ibase_execute,ibase_trans,%
5189    ibase_rollback,ibase_timefmt,ibase_num_fields,ibase_blob_add,%
5190    ibase_blob_close,ibase_blob_create,ibase_blob_echo,%
5191    ibase_blob_import,ibase_blob_info,ibase_blob_open,%
5192 %--- icap functions
5193    icap_open,icap_close,icap_fetch_event,icap_list_events,%
5194    icap_delete_event,icap_snooze,icap_list_alarms,%
```

```
5195    icap_rename_calendar,icap_delete_calendar,icap_reopen,%
5196  %--- iconv functions
5197    iconv,iconv_get_encoding,iconv_set_encoding,ob_iconv_handler,%
5198  %--- ifx functions
5199    ifx_connect,ifx_pconnect,ifx_close,ifx_query,ifx_prepare,ifx_do,%
5200    ifx_errormsg,ifx_affected_rows,ifx_getsqlca,ifx_fetch_row,%
5201    ifx_fieldtypes,ifx_fieldproperties,ifx_num_fields,ifx_num_rows,%
5202    ifx_create_char,ifx_free_char,ifx_update_char,ifx_get_char,%
5203    ifx_copy_blob,ifx_free_blob,ifx_get_blob,ifx_update_blob,%
5204    ifx_textasvarchar,ifx_byteasvarchar,ifx_nullformat,%
5205    ifxus_free_slob,ifxus_close_slob,ifxus_open_slob,%
5206    ifxus_seek_slob,ifxus_read_slob,ifxus_write_slob,%
5207  %--- iisfunc functions
5208    iis_get_server_by_path,iis_get_server_by_comment,iis_add_server,%
5209    iis_set_dir_security,iis_get_dir_security,iis_set_server_rights,%
5210    iis_set_script_map,iis_get_script_map,iis_set_app_settings,%
5211    iis_stop_server,iis_stop_service,iis_start_service,%
5212  %--- image functions
5213    exif_imagetype,exif_read_data,exif_thumbnail,getimagesize,%
5214    imagealphablending,imagearc,imagefilledarc,imageellipse,%
5215    imagechar,imagecharup,imagecolorallocate,imagecolordeallocate,%
5216    imagecolorclosest,imagecolorclosestalpha,imagecolorclosestthwb,%
5217    imagecolorexactalpha,imagecolorresolve,imagecolorresolvealpha,%
5218    imagecolorset,imagecolorsforindex,imagecolorstotal,%
5219    imagecopy,imagecopymerge,imagecopymergegray,imagecopyresized,%
5220    imagecreate,imagecreatetruecolor,imagetruecolortopalette,%
5221    imagecreatefromgd2,imagecreatefromgd2part,imagecreatefromgif,%
5222    imagecreatefrompng,imagecreatefromwbmp,imagecreatefromstring,%
5223    imagecreatefromxpm,imagedashedline,imagedestroy,imagefill,%
5224    imagefilledrectangle,imagefilltoborder,imagefontheight,%
5225    imagegd,imagegd2,imagegif,imagepng,imagejpeg,imagewbmp,%
5226    imageline,imageloadfont,imagepalettecopy,imagepolygon,%
5227    imagepsencodefont,imagepsfreefont,imagepsloadfont,%
5228    imagepsslantfont,imagepstext,imagerectangle,imagesetpixel,%
5229    imagesetstyle,imagesettile,imagesetthickness,imagestring,%
5230    imagesx,imagesy,imagettfbbox,imageftbbox,imagettftext,%
5231    imagetypes,jpeg2wbmp,png2wbmp,iptcembed,read_exif_data,%
5232  %--- imap functions
5233    imap_8bit,imap_alerts,imap_append,imap_base64,imap_binary,%
5234    imap_bodystruct,imap_check,imap_clearflag_full,imap_close,%
5235    imap_delete,imap_deletemailbox,imap_errors,imap_expunge,%
5236    imap_fetchbody,imap_fetchheader,imap_fetchstructure,%
5237    imap_getmailboxes,imap_getsubscribed,imap_header,%
5238    imap_headers,imap_last_error,imap_listmailbox,%
5239    imap_mail,imap_mail_compose,imap_mail_copy,imap_mail_move,%
5240    imap_mime_header_decode,imap_msgno,imap_num_msg,imap_num_recent,%
5241    imap_ping,imap_popen,imap_qprint,imap_renamemailbox,imap_reopen,%
5242    imap_rfc822_parse_headers,imap_rfc822_write_address,%
5243    imap_search,imap_setacl,imap_set_quota,imap_setflag_full,%
5244    imap_status,imap_subscribe,imap_uid,imap_undelete,%
5245    imap_utf7_decode,imap_utf7_encode,imap_utf8,imap_thread,%
5246  %--- info functions
5247    assert,assert_options,extension_loaded,dl,getenv,get_cfg_var,%
5248    get_defined_constants,get_extension_funcs,getmygid,%
```

```
5249    get_loaded_extensions,get_magic_quotes_gpc,%
5250    getlastmod,getmyinode,getmypid,getmyuid,get_required_files,%
5251    ini_alter,ini_get,ini_get_all,ini_restore,ini_set,phpcredits,%
5252    phpversion,php_logo_guid,php_sapi_name,php_uname,putenv,%
5253    set_time_limit,version_compare,zend_logo_guid,zend_version,%
5254  %--- ircg functions
5255    ircg_pconnect,ircg_fetch_error_msg,ircg_set_current,ircg_join,%
5256    ircg_msg,ircg_notice,ircg_nick,ircg_topic,ircg_channel_mode,%
5257    ircg_whois,ircg_kick,ircg_ignore_add,ircg_ignore_del,%
5258    ircg_is_conn_alive,ircg_lookup_format_messages,%
5259    ircg_set_on_die,ircg_set_file,ircg_get_username,%
5260    ircg_nickname_unescape,%
5261  %--- java functions
5262    java_last_exception_clear,java_last_exception_get,%
5263  %--- ldap functions
5264    ldap_add,ldap_bind,ldap_close,ldap_compare,ldap_connect,%
5265    ldap_delete,ldap_dn2ufn,ldap_err2str,ldap_errno,ldap_error,%
5266    ldap_first_attribute,ldap_first_entry,ldap_free_result,%
5267    ldap_get_dn,ldap_get_entries,ldap_get_option,ldap_get_values,%
5268    ldap_list,ldap_modify,ldap_mod_add,ldap_mod_del,%
5269    ldap_next_attribute,ldap_next_entry,ldap_read,ldap_rename,%
5270    ldap_set_option,ldap_unbind,ldap_8859_to_t61,%
5271    ldap_next_reference,ldap_parse_reference,ldap_parse_result,%
5272    ldap_sort,ldap_start_tls,ldap_t61_to_8859,%
5273  %--- mail functions
5274    mail,ezmlm_hash,%
5275  %--- math functions
5276    abs,acos,acosh,asin,asinh,atan,atanh,atan2,base_convert,bindec,%
5277    cos,cosh,decbin,dechex,decoct,deg2rad,exp,expm1,floor,%
5278    hexdec,hypot,is_finite,is_infinite,is_nan,lcg_value,log,log10,%
5279    max,min,mt_rand,mt_srand,mt_getrandmax,number_format,octdec,pi,%
5280    rad2deg,rand,round,sin,sinh,sqrt,srand,tan,tanh,%
5281  %--- mbstring functions
5282    mb_language,mb_parse_str,mb_internal_encoding,mb_http_input,%
5283    mb_detect_order,mb_substitute_character,mb_output_handler,%
5284    mb_strlen,mb_strpos,mb_strrpos,mb_substr,mb_strcut,mb_strwidth,%
5285    mb_convert_encoding,mb_detect_encoding,mb_convert_kana,%
5286    mb_decode_mimeheader,mb_convert_variables,%
5287    mb_decode_numericentity,mb_send_mail,mb_get_info,%
5288    mb_ereg,mb_eregi,mb_ereg_replace,mb_eregi_replace,mb_split,%
5289    mb_ereg_search,mb_ereg_search_pos,mb_ereg_search_regs,%
5290    mb_ereg_search_getregs,mb_ereg_search_getpos,%
5291  %--- mcal functions
5292    mcal_open,mcal_popen,mcal_reopen,mcal_close,%
5293    mcal_rename_calendar,mcal_delete_calendar,mcal_fetch_event,%
5294    mcal_append_event,mcal_store_event,mcal_delete_event,%
5295    mcal_list_alarms,mcal_event_init,mcal_event_set_category,%
5296    mcal_event_set_description,mcal_event_set_start,%
5297    mcal_event_set_alarm,mcal_event_set_class,mcal_is_leap_year,%
5298    mcal_date_valid,mcal_time_valid,mcal_day_of_week,%
5299    mcal_date_compare,mcal_next_recurrence,%
5300    mcal_event_set_recur_daily,mcal_event_set_recur_weekly,%
5301    mcal_event_set_recur_monthly_wday,mcal_event_set_recur_yearly,%
5302    mcal_event_add_attribute,mcal_expunge,mcal_week_of_year,%
```

```
5303    %--- mcrypt functions
5304      mcrypt_get_cipher_name,mcrypt_get_block_size,%
5305      mcrypt_create_iv,mcrypt_cbc,mcrypt_cfb,mcrypt_ecb,mcrypt_ofb,%
5306      mcrypt_list_modes,mcrypt_get_iv_size,mcrypt_encrypt,%
5307      mcrypt_module_open,mcrypt_module_close,mcrypt_generic_deinit,%
5308      mcrypt_generic,mdecrypt_generic,mcrypt_generic_end,%
5309      mcrypt_enc_is_block_algorithm_mode,%
5310      mcrypt_enc_is_block_mode,mcrypt_enc_get_block_size,%
5311      mcrypt_enc_get_supported_key_sizes,mcrypt_enc_get_iv_size,%
5312      mcrypt_enc_get_modes_name,mcrypt_module_self_test,%
5313      mcrypt_module_is_block_algorithm,mcrypt_module_is_block_mode,%
5314      mcrypt_module_get_algo_key_size,%
5315    %--- mhash functions
5316      mhash_get_hash_name,mhash_get_block_size,mhash_count,mhash,%
5317    %--- misc functions
5318      connection_aborted,connection_status,connection_timeout,%
5319      define,defined,die,eval,exit,get_browser,highlight_file,%
5320      ignore_user_abort,iptcparse,leak,pack,show_source,sleep,uniqid,%
5321      usleep,%
5322    %--- mnogosearch functions
5323      udm_add_search_limit,udm_alloc_agent,udm_api_version,%
5324      udm_cat_list,udm_clear_search_limits,udm_errno,udm_error,%
5325      udm_free_agent,udm_free_ispell_data,udm_free_res,%
5326      udm_get_res_field,udm_get_res_param,udm_load_ispell_data,%
5327      udm_check_charset,udm_check_stored,udm_close_stored,udm_crc32,%
5328    %--- msession functions
5329      msession_connect,msession_disconnect,msession_count,%
5330      msession_destroy,msession_lock,msession_unlock,msession_set,%
5331      msession_uniq,msession_randstr,msession_find,msession_list,%
5332      msession_set_array,msession_listvar,msession_timeout,%
5333      msession_getdata,msession_setdata,msession_plugin,%
5334    %--- msql functions
5335      msql,msql_affected_rows,msql_close,msql_connect,msql_create_db,%
5336      msql_data_seek,msql_dbname,msql_drop_db,msql_dropdb,msql_error,%
5337      msql_fetch_field,msql_fetch_object,msql_fetch_row,%
5338      msql_field_seek,msql_fieldtable,msql_fieldtype,msql_fieldflags,%
5339      msql_free_result,msql_freeresult,msql_list_fields,%
5340      msql_list_dbs,msql_listdbs,msql_list_tables,msql_listtables,%
5341      msql_num_rows,msql_numfields,msql_numrows,msql_pconnect,%
5342      msql_regcase,msql_result,msql_select_db,msql_selectdb,%
5343    %--- mssql functions
5344      mssql_close,mssql_connect,mssql_data_seek,mssql_fetch_array,%
5345      mssql_fetch_object,mssql_fetch_row,mssql_field_length,%
5346      mssql_field_seek,mssql_field_type,mssql_free_result,%
5347      mssql_min_error_severity,mssql_min_message_severity,%
5348      mssql_num_fields,mssql_num_rows,mssql_pconnect,mssql_query,%
5349      mssql_select_db,mssql_bind,mssql_execute,mssql_fetch_assoc,%
5350      mssql_guid_string,mssql_init,mssql_rows_affected,%
5351    %--- muscat functions
5352      muscat_setup,muscat_setup_net,muscat_give,muscat_get,%
5353    %--- mysql functions
5354      mysql_affected_rows,mysql_change_user,mysql_character_set_name,%
5355      mysql_connect,mysql_create_db,mysql_data_seek,mysql_db_name,%
5356      mysql_drop_db,mysql_errno,mysql_error,mysql_escape_string,%
```

```
5357    mysql_fetch_assoc,mysql_fetch_field,mysql_fetch_lengths,%
5358    mysql_fetch_row,mysql_field_flags,mysql_field_name,%
5359    mysql_field_seek,mysql_field_table,mysql_field_type,%
5360    mysql_info,mysql_insert_id,mysql_list_dbs,mysql_list_fields,%
5361    mysql_list_tables,mysql_num_fields,mysql_num_rows,%
5362    mysql_ping,mysql_query,mysql_unbuffered_query,%
5363    mysql_result,mysql_select_db,mysql_tablename,mysql_thread_id,%
5364    mysql_get_host_info,mysql_get_proto_info,mysql_get_server_info,%
5365  %--- network functions
5366    checkdnsrr,closelog,debugger_off,debugger_on,%
5367    fsockopen,gethostbyaddr,gethostbyname,gethostbynamel,getmxrr,%
5368    getprotobynumber,getservbyname,getservbyport,ip2long,long2ip,%
5369    pfsockopen,socket_get_status,socket_set_blocking,%
5370    syslog,%
5371  %--- nis functions
5372    yp_get_default_domain,yp_order,yp_master,yp_match,yp_first,%
5373    yp_errno,yp_err_string,yp_all,yp_cat,%
5374  %--- oci8 functions
5375    OCIDefineByName,OCIBindByName,OCILogon,OCIPLogon,OCINLogon,%
5376    OCIExecute,OCICommit,OCIRollback,OCINewDescriptor,OCIRowCount,%
5377    OCIResult,OCIFetch,OCIFetchInto,OCIFetchStatement,%
5378    OCIColumnName,OCIColumnSize,OCIColumnType,OCIServerVersion,%
5379    OCINewCursor,OCIFreeStatement,OCIFreeCursor,OCIFreeDesc,%
5380    OCIError,OCIInternalDebug,OCICancel,OCISetPrefetch,%
5381    OCISaveLobFile,OCISaveLob,OCILoadLob,OCIColumnScale,%
5382    OCIColumnTypeRaw,OCINewCollection,OCIFreeCollection,%
5383    OCICollAppend,OCICollAssignElem,OCICollGetElem,OCICollMax,%
5384    OCICollTrim,%
5385  %--- oracle functions
5386    Ora_Bind,Ora_Close,Ora_ColumnName,Ora_ColumnSize,Ora_ColumnType,%
5387    Ora_CommitOff,Ora_CommitOn,Ora_Do,Ora_Error,Ora_ErrorCode,%
5388    Ora_Fetch,Ora_Fetch_Into,Ora_GetColumn,Ora_Logoff,Ora_Logon,%
5389    Ora_Numcols,Ora_Numrows,Ora_Open,Ora_Parse,Ora_Rollback,%
5390  %--- outcontrol functions
5391    flush,ob_start,ob_get_contents,ob_get_length,ob_get_level,%
5392    ob_flush,ob_clean,ob_end_flush,ob_end_clean,ob_implicit_flush,%
5393  %--- ovrimos functions
5394    ovrimos_connect,ovrimos_close,ovrimos_longreadlen,%
5395    ovrimos_execute,ovrimos_cursor,ovrimos_exec,ovrimos_fetch_into,%
5396    ovrimos_result,ovrimos_result_all,ovrimos_num_rows,%
5397    ovrimos_field_name,ovrimos_field_type,ovrimos_field_len,%
5398    ovrimos_free_result,ovrimos_commit,ovrimos_rollback,%
5399  %--- pcntl functions
5400    pcntl_fork,pcntl_signal,pcntl_waitpid,pcntl_wexitstatus,%
5401    pcntl_wifsignaled,pcntl_wifstopped,pcntl_wstopsig,%
5402    pcntl_exec,%
5403  %--- pcre functions
5404    preg_match,preg_match_all,preg_replace,preg_replace_callback,%
5405    preg_quote,preg_grep,Pattern Modifiers,Pattern Syntax,%
5406  %--- pdf functions
5407    pdf_add_annotation,pdf_add_bookmark,pdf_add_launchlink,%
5408    pdf_add_note,pdf_add_outline,pdf_add_pdflink,pdf_add_thumbnail,%
5409    pdf_arc,pdf_arcn,pdf_attach_file,pdf_begin_page,%
5410    pdf_begin_template,pdf_circle,pdf_clip,pdf_close,pdf_closepath,%
```

```
5411    pdf_closepath_stroke,pdf_close_image,pdf_close_pdi,%
5412    pdf_concat,pdf_continue_text,pdf_curveto,pdf_delete,%
5413    pdf_endpath,pdf_end_pattern,pdf_end_template,pdf_fill,%
5414    pdf_findfont,pdf_get_buffer,pdf_get_font,pdf_get_fontname,%
5415    pdf_get_image_height,pdf_get_image_width,pdf_get_parameter,%
5416    pdf_get_pdi_value,pdf_get_majorversion,pdf_get_minorversion,%
5417    pdf_initgraphics,pdf_lineto,pdf_makespotcolor,pdf_moveto,%
5418    pdf_open,pdf_open_CCITT,pdf_open_file,pdf_open_gif,%
5419    pdf_open_image_file,pdf_open_jpeg,pdf_open_memory_image,%
5420    pdf_open_pdi_page,pdf_open_png,pdf_open_tiff,pdf_place_image,%
5421    pdf_rect,pdf_restore,pdf_rotate,pdf_save,pdf_scale,pdf_setcolor,%
5422    pdf_setflat,pdf_setfont,pdf_setgray,pdf_setgray_fill,%
5423    pdf_setlinecap,pdf_setlinejoin,pdf_setlinewidth,pdf_setmatrix,%
5424    pdf_setpolydash,pdf_setrgbcolor,pdf_setrgbcolor_fill,%
5425    pdf_set_border_color,pdf_set_border_dash,pdf_set_border_style,%
5426    pdf_set_duration,pdf_set_font,pdf_set_horiz_scaling,%
5427    pdf_set_info_author,pdf_set_info_creator,pdf_set_info_keywords,%
5428    pdf_set_info_title,pdf_set_leading,pdf_set_parameter,%
5429    pdf_set_text_rendering,pdf_set_text_rise,pdf_set_text_matrix,%
5430    pdf_set_word_spacing,pdf_show,pdf_show_boxed,pdf_show_xy,%
5431    pdf_stringwidth,pdf_stroke,pdf_translate,%
5432 %--- pfpro functions
5433    pfpro_init,pfpro_cleanup,pfpro_process,pfpro_process_raw,%
5434 %--- pgsql functions
5435    pg_close,pg_affected_rows,pg_connect,pg_dbname,pg_end_copy,%
5436    pg_query,pg_fetch_array,pg_fetch_object,pg_fetch_row,%
5437    pg_field_name,pg_field_num,pg_field_prtlen,pg_field_size,%
5438    pg_free_result,pg_last_oid,pg_host,pg_last_notice,pg_lo_close,%
5439    pg_lo_export,pg_lo_import,pg_lo_open,pg_lo_read,pg_lo_seek,%
5440    pg_lo_read_all,pg_lo_unlink,pg_lo_write,pg_num_fields,%
5441    pg_options,pg_pconnect,pg_port,pg_put_line,pg_fetch_result,%
5442    pg_client_encoding,pg_trace,pg_tty,pg_untrace,pg_get_result,%
5443    pg_send_query,pg_cancel_query,pg_connection_busy,%
5444    pg_connection_status,pg_copy_from,pg_copy_to,pg_escape_bytea,%
5445    pg_result_error,%
5446 %--- posix functions
5447    posix_kill,posix_getpid,posix_getppid,posix_getuid,%
5448    posix_getgid,posix_getegid,posix_setuid,posix_seteuid,%
5449    posix_setegid,posix_getgroups,posix_getlogin,posix_getpgrp,%
5450    posix_setpgid,posix_getpgid,posix_getsid,posix_uname,%
5451    posix_ctermid,posix_ttyname,posix_isatty,posix_getcwd,%
5452    posix_getgrnam,posix_getgrgid,posix_getpwnam,posix_getpwuid,%
5453 %--- printer functions
5454    printer_open,printer_abort,printer_close,printer_write,%
5455    printer_set_option,printer_get_option,printer_create_dc,%
5456    printer_start_doc,printer_end_doc,printer_start_page,%
5457    printer_create_pen,printer_delete_pen,printer_select_pen,%
5458    printer_delete_brush,printer_select_brush,printer_create_font,%
5459    printer_select_font,printer_logical_fontheight,%
5460    printer_draw_rectangle,printer_draw_elipse,printer_draw_text,%
5461    printer_draw_chord,printer_draw_pie,printer_draw_bmp,%
5462 %--- pspell functions
5463    pspell_add_to_personal,pspell_add_to_session,pspell_check,%
5464    pspell_config_create,pspell_config_ignore,pspell_config_mode,%
```

```
5465        pspell_config_repl,pspell_config_runtogether,%
5466        pspell_new,pspell_new_config,pspell_new_personal,%
5467        pspell_store_replacement,pspell_suggest,%
5468    %--- qtdom functions
5469        qdom_tree,qdom_error,%
5470    %--- readline functions
5471        readline,readline_add_history,readline_clear_history,%
5472        readline_info,readline_list_history,readline_read_history,%
5473    %--- recode functions
5474        recode_string,recode,recode_file,%
5475    %--- regex functions
5476        ereg,ereg_replace,eregi,eregi_replace,split,spliti,sql_regcase,%
5477    %--- sem functions
5478        sem_get,sem_acquire,sem_release,sem_remove,shm_attach,%
5479        shm_remove,shm_put_var,shm_get_var,shm_remove_var,ftok,%
5480    %--- sesam functions
5481        sesam_connect,sesam_disconnect,sesam_settransaction,%
5482        sesam_rollback,sesam_execimm,sesam_query,sesam_num_fields,%
5483        sesam_diagnostic,sesam_fetch_result,sesam_affected_rows,%
5484        sesam_field_array,sesam_fetch_row,sesam_fetch_array,%
5485        sesam_free_result,%
5486    %--- session functions
5487        session_start,session_destroy,session_name,session_module_name,%
5488        session_id,session_register,session_unregister,session_unset,%
5489        session_get_cookie_params,session_set_cookie_params,%
5490        session_encode,session_set_save_handler,session_cache_limiter,%
5491        session_write_close,%
5492    %--- shmop functions
5493        shmop_open,shmop_read,shmop_write,shmop_size,shmop_delete,%
5494    %--- snmp functions
5495        snmpget,snmpset,snmpwalk,snmpwalkoid,snmp_get_quick_print,%
5496        snmprealwalk,%
5497    %--- strings functions
5498        addcslashes,addslashes,bin2hex,chop,chr,chunk_split,%
5499        count_chars,crc32,crypt,echo,explode,get_html_translation_table,%
5500        hebrev,hebrevc,htmlentities,htmlspecialchars,implode,join,%
5501        localeconv,ltrim,md5,md5_file,metaphone,nl_langinfo,nl2br,ord,%
5502        print,printf,quoted_printable_decode,quotemeta,str_rot13,rtrim,%
5503        setlocale,similar_text,soundex,sprintf,strncasecmp,strcasecmp,%
5504        strcmp,strcoll,strcspn,strip_tags,stripcslashes,stripslashes,%
5505        strlen,strnatcmp,strnatcasecmp,strncmp,str_pad,strpos,strrchr,%
5506        strrev,strrpos,strspn,strstr,strtok,strtolower,strtoupper,%
5507        strtr,substr,substr_count,substr_replace,trim,ucfirst,ucwords,%
5508        vsprintf,wordwrap,%
5509    %--- swf functions
5510        swf_openfile,swf_closefile,swf_labelframe,swf_showframe,%
5511        swf_getframe,swf_mulcolor,swf_addcolor,swf_placeobject,%
5512        swf_removeobject,swf_nextid,swf_startdoaction,%
5513        swf_actiongeturl,swf_actionnextframe,swf_actionprevframe,%
5514        swf_actionstop,swf_actiontogglequality,swf_actionwaitforframe,%
5515        swf_actiongotolabel,swf_enddoaction,swf_defineline,%
5516        swf_definepoly,swf_startshape,swf_shapelinesolid,%
5517        swf_shapefillsolid,swf_shapefillbitmapclip,%
5518        swf_shapemoveto,swf_shapelineto,swf_shapecurveto,%
```

```
5519    swf_shapearc,swf_endshape,swf_definefont,swf_setfont,%
5520    swf_fontslant,swf_fonttracking,swf_getfontinfo,swf_definetext,%
5521    swf_definebitmap,swf_getbitmapinfo,swf_startsymbol,%
5522    swf_startbutton,swf_addbuttonrecord,swf_oncondition,%
5523    swf_viewport,swf_ortho,swf_ortho2,swf_perspective,swf_polarview,%
5524    swf_pushmatrix,swf_popmatrix,swf_scale,swf_translate,swf_rotate,%
5525    %--- sybase functions
5526    sybase_affected_rows,sybase_close,sybase_connect,%
5527    sybase_fetch_array,sybase_fetch_field,sybase_fetch_object,%
5528    sybase_field_seek,sybase_free_result,sybase_get_last_message,%
5529    sybase_min_error_severity,sybase_min_message_severity,%
5530    sybase_num_fields,sybase_num_rows,sybase_pconnect,sybase_query,%
5531    sybase_select_db,%
5532    %--- uodbc functions
5533    odbc_autocommit,odbc_binmode,odbc_close,odbc_close_all,%
5534    odbc_connect,odbc_cursor,odbc_do,odbc_error,odbc_errormsg,%
5535    odbc_execute,odbc_fetch_into,odbc_fetch_row,odbc_fetch_array,%
5536    odbc_fetch_object,odbc_field_name,odbc_field_num,%
5537    odbc_field_len,odbc_field_precision,odbc_field_scale,%
5538    odbc_longreadlen,odbc_num_fields,odbc_pconnect,odbc_prepare,%
5539    odbc_result,odbc_result_all,odbc_rollback,odbc_setoption,%
5540    odbc_tableprivileges,odbc_columns,odbc_columnprivileges,%
5541    odbc_primarykeys,odbc_foreignkeys,odbc_procedures,%
5542    odbc_specialcolumns,odbc_statistics,%
5543    %--- url functions
5544    base64_decode,base64_encode,parse_url,rawurldecode,rawurlencode,%
5545    urlencode,%
5546    %--- var functions
5547    doubleval,empty,floatval,gettype,get_defined_vars,%
5548    import_request_variables,intval,is_array,is_bool,is_double,%
5549    is_int,is_integer,is_long,is_null,is_numeric,is_object,is_real,%
5550    is_scalar,is_string,isset,print_r,serialize,settype,strval,%
5551    unset,var_dump,var_export,is_callable,%
5552    %--- vpopmail functions
5553    vpopmail_add_domain,vpopmail_del_domain,%
5554    vpopmail_add_domain_ex,vpopmail_del_domain_ex,%
5555    vpopmail_add_user,vpopmail_del_user,vpopmail_passwd,%
5556    vpopmail_auth_user,vpopmail_alias_add,vpopmail_alias_del,%
5557    vpopmail_alias_get,vpopmail_alias_get_all,vpopmail_error,%
5558    %--- w32api functions
5559    w32api_set_call_method,w32api_register_function,%
5560    w32api_deftype,w32api_init_dtype,%
5561    %--- wddx functions
5562    wddx_serialize_value,wddx_serialize_vars,wddx_packet_start,%
5563    wddx_add_vars,wddx_deserialize,%
5564    %--- xml functions
5565    xml_parser_create,xml_set_object,xml_set_element_handler,%
5566    xml_set_processing_instruction_handler,xml_set_default_handler,%
5567    xml_set_notation_decl_handler,%
5568    xml_parse,xml_get_error_code,xml_error_string,%
5569    xml_get_current_column_number,xml_get_current_byte_index,%
5570    xml_parser_free,xml_parser_set_option,xml_parser_get_option,%
5571    utf8_encode,xml_parser_create_ns,%
5572    xml_set_start_namespace_decl_handler,%
```

```
5573   %--- xslt functions
5574     xslt_set_log,xslt_create,xslt_errno,xslt_error,xslt_free,%
5575     xslt_set_sax_handler,xslt_set_scheme_handler,%
5576     xslt_set_base,xslt_set_encoding,xslt_set_sax_handlers,%
5577   %--- yaz functions
5578     yaz_addinfo,yaz_close,yaz_connect,yaz_errno,yaz_error,yaz_hits,%
5579     yaz_database,yaz_range,yaz_record,yaz_search,yaz_present,%
5580     yaz_scan,yaz_scan_result,yaz_ccl_conf,yaz_ccl_parse,%
5581     yaz_wait,yaz_sort,%
5582   %--- zip functions
5583     zip_close,zip_entry_close,zip_entry_compressedsize,%
5584     zip_entry_filesize,zip_entry_name,zip_entry_open,zip_entry_read,%
5585     zip_read,%
5586   %--- zlib functions
5587     gzclose,gzeof,gzfile,gzgetc,gzgets,gzgetss,gzopen,gzpassthru,%
5588     gzread,gzrewind,gzseek,gztell,gzwrite,readgzfile,gzcompress,%
5589     gzdeflate,gzinflate,gzencode,},%
5590     sensitive,%
5591     morecomment=[l]\#,%
5592     morecomment=[l]//,%
5593     morecomment=[s]{/*}{*/},%
5594     morestring=[b]",%
5595     morestring=[b]'%
5596   }[keywords,comments,strings]%
5597 ⟨/lang2⟩
```

2.59 Plasm

Alessio Pace provided the following definition.

```
5598 ⟨*lang3⟩
```

```
5599 \lst@definelanguage{Plasm}%
5600   {sensitive=false,%
5601    morekeywords={aa,abs,ac,acolor,acos,actor,al,alias,align,and,%
5602       animation,animation,appearance,apply,ar,arc,as,asin,assoc,atan,%
5603       axialcamera,axialcameras,basehermite,bbox,bbox,bernstein,%
5604       bernsteinbasis,bezier,beziercurve,beziermanifold,bezierstripe,%
5605       beziersurface,bigger,biggest,bilinearsurface,binormal,%
5606       biquadraticsurface,black,blend,blue,bottom,box,brown,bspize,%
5607       bspline,bsplinebasis,c,cabinet,camera,cart,case,cat,catch,ceil,%
5608       centeredcameras,centralcavalier,char,charseq,choose,circle,%
5609       circumference,class,cmap,color,comp,computecoords,cone,%
5610       conicalsurface,cons,control,convexcoords,convexhull,coonspatch,%
5611       copy,cos,cosh,crease,crosspolytope,cube,cubiccardinal,%
5612       cubiccardinalbasis,cubichermite,cubicubspline,cubicubsplinebasis,%
5613       cuboid,curl,curvature,curve2cspath,curve2mapvect,cyan,cylinder,%
5614       cylindricalsurface,d,deboor,def,depol,depth_sort,depth_test,%
5615       derbernstein,derbernsteinbase,derbezier,determinant,difference,%
5616       differencepr,dim,dimetric,dirproject,displaygraph,displaynubspline,%
5617       displaynurbspline,distl,distr,div,divergence,dodecahedron,dot,down,%
5618       dp,drawedges,drawforks,drawtree,ds,dsphere,dump,dumprep,ellipse,%
5619       embed,end,eq,ex,exp,explode,export,extract_bodies,extract_polygons,%
5620       extract_wires,extrude,extrusion,fact,false,feature,ff,fillcolor,%
5621       filter,finitecone,first,flash,flashani,floor,fontcolor,fontheight,%
```

```
5622        fontspacing,fontwidth,fractalsimplex,frame,frame,frameflash,fromto,%
5623        gausscurvature,ge,grad,gradient,gradmap,gray,green,gt,help,hermite,%
5624        hermitebasis,hermitesurface,hexahedron,icosahedron,id,idnt,if,in,%
5625        inarcs,innerprod,inset,insl,insr,intersection,intersectionpr,%
5626        intervals,intmax,intmin,intsto,inv,isa,isanimpol,isbool,ischar,%
5627        isclosedshape,iscloseto,isempty,iseven,isfun,isfunvect,isge,isgt,%
5628        isint,isintneg,isinto,isintpos,isle,islt,ismat,ismatof,isnat,%
5629        isnull,isnum,isnumneg,isnumpos,isodd,isometric,isorthoshape,ispair,%
5630        ispoint,ispointseq,ispol,ispoldim,ispolytope,ispurepol,isreal,%
5631        isrealneg,isrealpos,isrealvect,isseq,isseqof,isshape,issimplex,%
5632        issqrmat,isstring,isvect,iszero,jacobian,join,joints,k,last,le,%
5633        left,leftcavalier,len,less,lesseq,lex,lift,light,linecolor,%
5634        linesize,list,ln,load,loadlib,loop,lt,lxmy,magenta,map,mapshapes,%
5635        markersize,mat,matdotprod,material,mathom,max,mean,meanpoint,med,%
5636        merge,mesh,min,minkowski,mirror,mixedprod,mk,mkframe,mkpol,%
5637        mkvector,mkversork,mod,model,move,mul,multextrude,mxby,mxmy,mxty,%
5638        myfont,n,nat2string,neq,ngon,norm2,normalmap,not,nu_grid,nubspline,%
5639        nubsplineknots,nurbspline,nurbsplineknots,octahedron,offset,%
5640        onepoint,open,optimize,or,orange,ord,ortho,orthoproject,orthox,%
5641        orthoy,orthoz,outarcs,outerloop,outerwarp,pairdiff,parallel,%
5642        pascaltriangle,pdiff,pdifference,permutahedron,permutations,%
5643        perspective,perspective,pi,pivotop,plane,planemapping,pmap,%
5644        points2shape,polar,polyline,polymarker,polypoint,power,powerset,%
5645        presort,principalnormal,print,prism,profileprodsurface,%
5646        progressivesum,project,projection,purple,pyramid,q,quadarray,%
5647        quadmesh,quote,r,raise,range,rationalbezier,rationalblend,%
5648        rationalbspline,rationalize,red,rev,reverse,rgbacolor,right,%
5649        rightcavalier,ring,rn,rotatedtext,rotationalsurface,rotn,rtail,%
5650        ruledsurface,rxmy,s,save,scalarmatprod,scalarvectprod,schlegel2d,%
5651        schlegel3d,sdifference,sdifferencepr,segment,sel,setand,setdiff,%
5652        setfontcolor,setor,setxor,sex,shape_0,shape_1,shape2points,%
5653        shape2pol,shapeclosed,shapecomb,shapediff,shapedist,%
5654        shapeinbetweening,shapeinf,shapejoin,shapelen,shapenorm,%
5655        shapenormal,shapeprod,shaperot,shapesum,shapesup,shapezero,shift,%
5656        showprop,sign,signal,simplex,simplexpile,sin,sinh,size,skeleton,%
5657        skew,smaller,smallest,solidifier,solidify,sort,sphere,spline,%
5658        splinesampling,splitcells,splitpols,sqr,sqrt,star,string,%
5659        stringtokens,struct,sub,svg,sweep,t,tail,tan,tangent,tanh,%
5660        tensorprodsurface,tetrahedron,text,texture,textwithattributes,%
5661        thinsolid,threepoints,time,tmax,tmin,top,torus,torusmap,trace,%
5662        trans,tree,trianglefan,trianglestripe,trimetric,true,truncone,tt,%
5663        tube,twopoints,uk,ukpol,ukpolf,union,unionpr,unitvect,unprune,up,%
5664        vect2dtoangle,vect2mat,vectdiff,vectnorm,vectprod,vectsum,view,%
5665        viewmodel,viewmodel,vrml,warp,warp,where,white,with,xcavalier,xor,%
5666        xquadarray,xx,ycavalier,yellow},%
5667    moredirectives={loadlib},%
5668    otherkeywords={-,+,*,**,/,~,|,..,^,\&,\&\&,\#,\#\#},%
5669    morecomment=[s]{\%}{\%},%
5670    morestring=[b]',%
5671    literate={~}{{$\sim$}}{1} {^}{$\wedge$}{1},%
5672  }[keywords,directives,comments,strings]%

5673 ⟨/lang3⟩
```

2.60 PL/I

Found the data in

- BERNHARD FISCHER, HERMAN FISCHER: **Structured Programming in PL/I and PL/C**; Copyright © 1976 by Marcel Dekker, Inc.; ISBN 0-8247-6394-7

```
5674 ⟨∗lang3⟩

5675 \lst@definelanguage{PL/I}{%
5676   morekeywords={ABS, ATAN, AUTOMATIC, AUTO, ATAND, BEGIN, BINARY, BIN, BIT,%
5677     BUILTIN, BY, CALL, CHARACTER, CHAR, CHECK, COLUMN, COL, COMPLEX, CPLX,%
5678     COPY, COS, COSD, COSH, DATA, DATE, DECIMAL, DEC, DECLARE, DCL, DO,%
5679     EDIT, ELSE, END, ENDFILE, ENDPAGE, ENTRY, EXP, EXTERNAL, EXT, FINISH,%
5680     FIXED, FIXEDOVERFLOW, FOFL, FLOAT, FORMAT, GET, GO, GOTO, IF, IMAG,%
5681     INDEX, INITIAL, INIT, INTERNAL, INT, LABEL, LENGTH, LIKE, LINE, LIST,%
5682     LOG, LOG2, LOG10, MAIN, MAX, MIN, MOD, NOCHECK, NOFIXEDOVERFLOW,%
5683     NOFOFL, NOOVERFLOW, NOOFL, NOSIZE, NOUNDERFLOW, NOUFL, NOZERODIVIDE,%
5684     NOZDIV, ON, OPTIONS, OVERFLOW, OFL, PAGE, PICTURE, PROCEDURE, PROC,%
5685     PUT, READ, REPEAT, RETURN, RETURNS, ROUND, SIN, SIND, SINH, SIZE, SKIP,%
5686     SQRT, STATIC, STOP, STRING, SUBSTR, SUM, SYSIN, SYSPRINT, TAN, TAND,%
5687     TANH, THEN, TO, UNDERFLOW, UFL, VARYING, WHILE, WRITE, ZERODIVIDE,%
5688     ZDIV},%
5689   sensitive=f,%
5690   morecomment=[s]{/*}{*/},%
5691   morestring=[d]'%
5692 }[keywords,comments,strings]%

5693 ⟨/lang3⟩
```

2.61 PostScript

Herbert Voss provided the following definition, written by Christophe Jorssen provided the following definition.

```
5694 ⟨∗lang3⟩

5695 %%
5696 %% PostScript language definition (c) 2005 Christophe Jorssen.
5697 %%
5698 \lst@definelanguage{PostScript}{%
5699   morekeywords={abs, add, aload, anchorsearch, and, arc, arcn, arct, arcto,%
5700     array, ashow, astore, atan, awidthshow, begin, bind, bitshift,%
5701     bytesavailable, cachestatus, ceiling, charpath, clear, cleartomark,%
5702     cleardictstack, clip, clippath, closefile, closepath, colorimage,%
5703     concat, concatmatrix, condition, copy, copypage, cos, count,%
5704     countdictstack, countexecstack, counttomark, cshow,%
5705     currentblackgeneration, currentcacheparams, currentcmykcolor,%
5706     currentcolor, currentcolorrendering, currentcolorscreen,%
5707     currentcolorspace, currentcolortransfer, currentcontext, currentdash,%
5708     currentdevparams, currentdict, currentfile, currentflat, currentfont,%
5709     currentglobal, currentgray, currentgstate, currenthalftone,%
5710     currenthalftonephase, currenthsbcolor, currentlinecap, currentlinejoin,%
5711     currentlinewidth, currentmatrix, currentmiterlimit,%
5712     currentobjectformat, currentpacking, currentpagedevice, currentpoint,%
5713     currentrgbcolor, currentscreen, currentshared, currentstrokeadjust,%
```

```
5714    currentsystemparams, currenttransfer, currentundercolorremoval,%
5715    currentuserparams, curveto, cvi, cvlit, cvn, cvr, cvrs, cvs, cvx, def,%
5716    defaultmatrix, definefont, defineresource, defineusername,%
5717    defineuserobject, deletefile, detach, deviceinfo, dict, dictstack, div,%
5718    dtransform, dup, echo, eexec, end, eoclip, eofill, eoviewclip, eq,%
5719    erasepage, errordict, exch, exec, execform, execstack, execuserobject,%
5720    executeonly, executive, exit, exp, false, file, filenameforall,%
5721    fileposition, fill, filter, findencoding, findfont, findresource,%
5722    flattenpath, floor, flush, flushfile, FontDirectory, for, forall, fork,%
5723    ge, get, getinterval, globaldict, GlobalFontDirectory, glyphshow,%
5724    grestore, grestoreall, gsave, gstate, gt, identmatrix, idiv,%
5725    idtransform, if, ifelse, image, imagemask, index, ineofill, infill,%
5726    initclip, initgraphics, initmatrix, initviewclip, instroke,%
5727    internaldict, inueofill, inufill, inustroke, invertmatrix,%
5728    ISOLatin1Encoding, itransform, join, kshow, known, languagelevel, le,%
5729    length, lineto, ln, load, lock, log, loop, lt, makefont, makepattern,%
5730    mark, matrix, maxlength, mod, monitor, moveto, mul, ne, neg, newpath,%
5731    noaccess, not, notify, null, nulldevice, or, packedarray, pathbbox,%
5732    pathforall, pop, print, printobject, product, prompt, pstack, put,%
5733    putinterval, quit, rand, rcurveto, read, readhexstring, readline,%
5734    readonly, readstring, realtime, rectclip, rectfill, rectstroke,%
5735    rectviewclip, renamefile, repeat, resetfile, resourceforall,%
5736    resourcestatus, restore, reversepath, revision, rlineto, rmoveto, roll,%
5737    rootfont, rotate, round, rrand, run, save, scale, scalefont, scheck,%
5738    search, selectfont, serialnumber, setbbox, setblackgeneration,%
5739    setcachedevice, setcachedevice2, setcachelimit, setcacheparams,%
5740    setcharwidth, setcmykcolor, setcolor, setcolorrendering,%
5741    setcolorscreen, setcolorspace, setcolortransfer, setdash, setdevparams,%
5742    setfileposition, setflat, setfont, setglobal, setgray, setgstate,%
5743    sethalftone, sethalftonephase, sethsbcolor, setlinecap, setlinejoin,%
5744    setlinewidth, setmatrix, setmiterlimit, setobjectformat, setoverprint,%
5745    setpacking, setpagedevice, setpattern, setrgbcolor, setscreen,%
5746    setshared, setstrokeadjust, setsystemparams, settransfer,%
5747    setucacheparams, setundercolorremoval, setuserparams, setvmthreshold,%
5748    shareddict, show, showpage, sin, sqrt, srand, stack, StandardEncoding,%
5749    start, startjob, status, statusdict, stop, stopped, store, string,%
5750    stringwidth, stroke, strokepath, sub, systemdict, transform, translate,%
5751    true, truncate, type, token, uappend, ucache, ucachestatus, ueofill,%
5752    ufill, undef, upath, userdict, UserObjects, usertime, ustroke,%
5753    ustrokepath, version, viewclip, viewclippath, vmreclaim, vmstatus,%
5754    wait, wcheck, where, widthshow, write, writehexstring, writeobject,%
5755    writestring, wtranslation, xcheck, xor, xshow, xyshow, yield, yshow},%
5756  sensitive,%
5757  morecomment=[l]\%}[keywords,comments]
```

5758 ⟨/lang3⟩

2.62   POV-Ray

Berthold Höllmann sent me the definition. But I removed `blankstring=false` and `flexiblecolumns=true` from the driver since they have nothing to do with a language definition.

5759 ⟨∗lang1⟩

5760 `%%`

```
5761 %% POV definition (c) 1999 Berthold H\"ollmann
5762 %%
5763 \lst@definelanguage{POV}%
5764   {morekeywords={abs,absorption,acos,acosh,adaptive,adc_bailout,agate,%
5765       agate_turb,all,alpha,ambient,ambient_light,angle,aperture,append,%
5766       arc_angle,area_light,array,asc,asin,asinh,assumed_gamma,atan,%
5767       atan2,atanh,average,background,bezier_spline,bicubic_patch,%
5768       black_hole,blob,blue,blur_samples,bounded_by,box,boxed,bozo,%
5769       break,brick,brick_size,brightness,brilliance,bumps,bump_map,%
5770       bump_size,camera,case,caustics,ceil,checker,chr,clipped_by,clock,%
5771       clock_delta,color,color_map,colour,colour_map,component,%
5772       composite,concat,cone,confidence,conic_sweep,control0,control1,%
5773       cos,cosh,count,crackle,crand,cube,cubic,cubic_spline,cubic_wave,%
5774       cylinder,cylindrical,debug,declare,default,defined,degrees,%
5775       density,density_file,density_map,dents,difference,diffuse,%
5776       dimensions,dimension_size,direction,disc,distance,%
5777       distance_maximum,div,eccentricity,else,emission,end,error,%
5778       error_bound,exp,extinction,fade_distance,fade_power,falloff,%
5779       falloff_angle,false,fclose,file_exists,filter,finish,fisheye,%
5780       flatness,flip,floor,focal_point,fog,fog_alt,fog_offset,fog_type,%
5781       fopen,frequency,gif,global_settings,gradient,granite,%
5782       gray_threshold,green,height_field,hexagon,hf_gray_16,hierarchy,%
5783       hollow,hypercomplex,if,ifdef,iff,ifndef,image_map,include,int,%
5784       interior,interpolate,intersection,intervals,inverse,ior,irid,%
5785       irid_wavelength,jitter,julia_fractal,lambda,lathe,leopard,%
5786       light_source,linear_spline,linear_sweep,local,location,log,%
5787       looks_like,look_at,low_error_factor,macro,mandel,map_type,marble,%
5788       material,material_map,matrix,max,max_intersections,max_iteration,%
5789       max_trace_level,media,media_attenuation,media_interaction,merge,%
5790       mesh,metallic,min,minimum_reuse,mod,mortar,nearest_count,no,%
5791       normal,normal_map,no_shadow,number_of_waves,object,octaves,off,%
5792       offset,omega,omnimax,on,once,onion,open,orthographic,panoramic,%
5793       perspective,pgm,phase,phong,phong_size,pi,pigment,pigment_map,%
5794       planar,plane,png,point_at,poly,polygon,poly_wave,pot,pow,ppm,%
5795       precision,prism,pwr,quadratic_spline,quadric,quartic,quaternion,%
5796       quick_color,quick_colour,quilted,radial,radians,radiosity,radius,%
5797       rainbow,ramp_wave,rand,range,ratio,read,reciprocal,%
5798       recursion_limit,red,reflection,reflection_exponent,refraction,%
5799       render,repeat,rgb,rgbf,rgbft,rgbt,right,ripples,rotate,roughness,%
5800       samples,scale,scallop_wave,scattering,seed,shadowless,sin,%
5801       sine_wave,sinh,sky,sky_sphere,slice,slope_map,smooth,%
5802       smooth_triangle,sor,specular,sphere,spherical,spiral1,spiral2,%
5803       spotlight,spotted,sqr,sqrt,statistics,str,strcmp,strength,strlen,%
5804       strlwr,strupr,sturm,substr,superellipsoid,switch,sys,t,tan,tanh,%
5805       text,texture,texture_map,tga,thickness,threshold,tightness,tile2,%
5806       tiles,torus,track,transform,translate,transmit,triangle,%
5807       triangle_wave,true,ttf,turbulence,turb_depth,type,u,%
5808       ultra_wide_angle,undef,union,up,use_color,use_colour,use_index,%
5809       u_steps,v,val,variance,vaxis_rotate,vcross,vdot,version,vlength,%
5810       vnormalize,vrotate,v_steps,warning,warp,water_level,waves,while,%
5811       width,wood,wrinkles,write,x,y,yes,z},%
5812   moredirectives={break,case,debug,declare,default,else,end,fclose,%
5813       fopen,local,macro,read,render,statistics,switch,undef,version,%
5814       warning,write},%
```

```
5815    moredelim=*[directive]\#,%
5816    sensitive,%
5817    morecomment=[l]//,%
5818    morecomment=[s]{/*}{*/},%
5819    morestring=[d]",%
5820    }[keywords,directives,comments,strings]%
```

5821 ⟨/lang1⟩

2.63 Prolog

Dominique de Waleffe mailed me the data for Prolog. He took the keywords from the LGrind language definition file.

5822 ⟨∗lang2⟩

```
5823 %%
5824 %% Prolog definition (c) 1997 Dominique de Waleffe
5825 %%
5826 \lst@definelanguage{Prolog}%
5827    {morekeywords={op,mod,abort,ancestors,arg,ascii,ask,assert,asserta,%
5828        assertz,atom,atomic,char,clause,close,concat,consult,ed,ef,em,%
5829        eof,fail,file,findall,write,functor,getc,integer,is,length,%
5830        listing,load,name,nl,nonvar,not,numbervars,op,or,pp,prin,print,%
5831        private,prompt,putc,ratom,read,read_from_this_file,rename,repeat,%
5832        retract,retractall,save,see,seeing,seen,sh,skip,statistics,%
5833        subgoal_of,system,tab,tell,telling,time,told,trace,true,unload,%
5834        untrace,var,write},%
5835    sensitive=f,%
5836    morecomment=[l]\%,%
5837    morecomment=[s]{/*}{*/},%
5838    morestring=[bd]",%
5839    morestring=[bd]'%
5840    }[keywords,comments,strings]%
```

5841 ⟨/lang2⟩

2.64 Promela

Thanks to William ThimblebyPromela for this language definition.

5842 ⟨∗lang3⟩

```
5843 %%
5844 %% Promela definition (c) 2004 William Thimbleby
5845 %%
5846 \lst@definelanguage{Promela}
5847    {morekeywords={active,assert,atomic,bit,bool,break,byte,chan,d_step,%
5848        Dproctype,do,else,empty,enabled,fi,full,goto,hidden,if,init,int,%
5849        len,mtype,nempty,never,nfull,od,of,pcvalue,printf,priority,%
5850        proctype,provided,run,short,skip,timeout,typedef,unless,unsigned,%
5851        xr,xs,true,false,inline,eval},%
5852    moredirectives={define,ifdef,ifndef,if,if,else,endif,undef,include},%
5853    moredelim=*[directive]\#,%
5854    morecomment=[s]{/*}{*/},%
5855    morestring=[b]"%
5856    }[keywords,comments,strings,directives]%
```

5857 ⟨/lang3⟩

2.65 PSTricks

PSTricks is a T_EX macro package bundle. Herbert Voss provided the following definition.

```
5858 ⟨*lang3⟩

5859 %%
5860 %% PSTricks definition (c) 2006 Herbert Voss
5861 %%
5862 \lst@definelanguage{PSTricks}%
5863   {morekeywords={%
5864     begin,end,definecolor,multido,%
5865     KillGlue,DontKillGlue,pslbrace,bsrbrace,psscalebox,psset,pstVerb,pstverb,%
5866     pst@def,psframebox,psclip,endclip,endpspicture,psframe,%
5867 %%    pspicture,%
5868     multirput,multips,Rput,rput,uput,cput,lput,%
5869     newrgbcolor,newgray,newcmykcolor,%
5870 %%
5871 %% pstricks-add
5872     psStep,psgraph,psbrace,psPrintValue,%
5873 %%
5874 %% pst-plot
5875     psvlabel,pshlabel,psplot,psline,pscustom,pscurve,psccurve,%
5876     readdata,savedata,fileplot,dataplot,listplot,%
5877     psecurce,psgraph,parametricplot,%
5878     psellipse,psaxes,ncline,nccurve,psbezier,parabola,%
5879     qdisk,qline,clipbox,endpsclip,%
5880     psgrid,pscircle,pscirclebox,psdiabox,pstribox,%
5881     newpsfontdot,psdot,psdots,%
5882     pspolygon,psdiamond,psoval,pstriangle,%
5883     psarc,psarcn,psellipticarc,psellipticarcn,pswedge,psellipticwedge,%
5884     pcline,pcdiag,pcdiagg,pccurve,pccurve,pcecurve,%
5885     scalebox,scaleboxto,psmathboxtrue,everypsbox,psverbboxtrue,overlaybox,%
5886     psoverlay,putoverlaybox,%
5887     newpsstyle,newpsobject,%
5888     moveto,newpath,closepath,stroke,fill,gsave,grestore,msave,mrestore,%
5889     translate,scale,swapaxes,rotate,openshadow,closedshadow,movepath,%
5890     lineto,rlineto,curveto,rcurveto,code,dim,coor,rcoor,file,arrows,%
5891     setcolor,rotateleft,rotateright,rotatedown,%
5892 %%
5893 %% pst-node
5894     nput,naput,nbput,ncput,%
5895     ncarc,ncbox,ncangle,ncangles,ncloop,ncdiag,ncdiagg,ncarcbox,ncbar,%
5896     cnodeput,nccircle,%
5897     pnode,rnode,Rnode,Cnode,cnode,fnode,%
5898     circlenode,ovalnode,trinode,dianode,%
5899     psmatrix,endpsmatrix,psspan,%
5900 %%
5901 %% pst-tree
5902     pstree,Tcircle,TCircle,Ttri,Tn,TC,Tc,Tfan,TR,Tr,Tdia,Toval,Tdot,Tp,Tf,%
5903     skiplevel,skiplevels,endskiplevels,tspace,tlput,%
5904 %%
5905 %% pst-text
5906     pscharpath,pstextpath,%
5907 %%
```

126

```
5908 %% pst-barcode
5909     psbarcode,%
5910 %%
5911 %% pst-coil
5912     psboxfill,pscoil,psCoil,pszigzag,nccoil,%
5913     psshadow,pstilt,psTilt,ThreeDput,%
5914 %%
5915 %% pst-gr3d
5916     PstGridThreeDNodeProcessor,%
5917 %%
5918 %% pst-vue3d
5919     PstGridThreeD,%
5920     AxesThreeD,LineThreeD,DieThreeD,FrameThreeD,SphereCircleThreeD,%
5921     SphereMeridienThreeD,QuadrillageThreeD,TetraedreThreeD,%
5922     PyramideThreeD,ConeThreeD,CylindreThreeD,DodecahedronThreeD,%
5923     ConeThreeD,SphereThreeD,SphereInverseThreeD,DemiSphereThreeD,%
5924     SphereCreuseThreeD,SphereCircledThreeD,PortionSphereThreeD,%
5925     pNodeThreeD,CubeThreeD,%
5926 %%
5927 %% pst-3dplot
5928     pstThreeDCoor, pstThreeDDot, pstThreeDTriangle, pstThreeDCircle,%
5929     pstPlanePut, pstThreeDBox, pstThreeDEllipse, pstThreeDLine,%
5930     pstThreeDPut, pstThreeDNode, pstThreeDSquare, psplotThreeD,%
5931     parametricplotThreeD, fileplotThreeD, dataplotThreeD,%
5932     pstScalePoints,%
5933 %%
5934 %% pst-circ
5935     resistor,battery,Ucc,Icc,capacitor,coil,diode,Zener,LED,lamp,switch,%
5936     wire,tension,circledipole,multidipole,OA,transistor,Tswitch,%
5937     potentiometer,transformer,optoCoupler,logic,%
5938 %%
5939 %% pst-eucl
5940     pstTriangle,pstMediatorAB,pstInterLL,pstMiddleAB,pstProjection,%
5941     pstCircleOA,pstLineAB,%
5942 %%
5943 %% pst-func
5944     psBessel,psPolynomial,psFourier,psGaussI,psGauss,psSi,pssi,psCi,psci,%
5945 %%
5946 %% pst-infixplot
5947     psPlot,%
5948 %%
5949 %% pst-ob3d
5950     PstDie,PstCube,%
5951 %%
5952 %% pst-poly
5953     PstPolygon,pspolygonbox,%
5954 %%
5955 %% pst-bar
5956     psbarchart,readpsbardata,psbarscale,newpsbarstyle,%
5957 %%
5958 %% pst-lens
5959     PstLens,%
5960 %%
5961 %% pst-geo
```

```
5962     WorldMap,WorldMapII,WorldMapThreeD,WorldMapThreeDII,pnodeMap,MapPut,%
5963 %%
5964 %% pst-autoseg
5965     asr,firstnode,merge,massoc,labelmerge,%
5966 %%
5967 %% gastex
5968     node,imark,fmark,rmark,drawqbpedge,drawedge,drawloop,%
5969 %%
5970 %% pst-labo
5971     Distillation,Ballon,%
5972 %%
5973 %% pst-optic
5974     lens,Transform,%
5975 %%
5976 %% pst-light3d
5977     PstLightThreeDText,%
5978 %%
5979 %% calendrier
5980     Calendrier,%
5981 %%
5982 %% pst-osci
5983     Oscillo%
5984   },%
5985   sensitive,%
5986   alsoother={0123456789$_},%
5987   morecomment=[l]\% %
5988   }[keywords,comments]%
```

5989 ⟨/lang3⟩

2.66 Python

Michael Weber sent me the definition. He got data from Mark Lutz: **Programming Python**; O'Reilly 1996; ISBN 1-56592-197-6. Stephen Kelly reported some problems that indicated that the comment definitions needed to be moved after the string definitions to work correctly.

In August 2013 Alexis Dimitriadis reworked the definition by supplying the builtins.

5990 ⟨∗lang1⟩

```
5991 %%
5992 %% Python definition (c) 1998 Michael Weber
5993 %% Additional definitions (2013) Alexis Dimitriadis
5994 %%
5995 \lst@definelanguage{Python}{%
5996   morekeywords={access, and, break, class, continue, def, del, elif, else,%
5997     except, exec, finally, for, from, global, if, import, in, is, lambda,%
5998     not, or, pass, print, raise, return, try, while},%
```

Python has a long list of builtin-in functions (http://docs.python.org/2/library/functions.html) and it is a good idea to make them visible in printed code

```
5999   % Built-ins
6000   morekeywords=[2]{abs, all, any, basestring, bin, bool, bytearray,%
```

128

```
6001    callable, chr, classmethod, cmp, compile, complex, delattr, dict, dir,%
6002    divmod, enumerate, eval, execfile, file, filter, float, format,%
6003    frozenset, getattr, globals, hasattr, hash, help, hex, id, input, int,%
6004    isinstance, issubclass, iter, len, list, locals, long, map, max,%
6005    memoryview, min, next, object, oct, open, ord, pow, property, range,%
6006    raw_input, reduce, reload, repr, reversed, round, set, setattr, slice,%
6007    sorted, staticmethod, str, sum, super, tuple, type, unichr, unicode,%
6008    vars, xrange, zip, apply, buffer, coerce, intern},%
6009  sensitive=true,%
6010  morecomment=[l]\#,%
6011  morestring=[b]',%
6012  morestring=[b]",%
```

According to PEP (Python Enhancement Proposals) comment should be distinguished from documentation strings, so we define

```
6013    morecomment=[s]{'''}{'''},% used for documentation text
6014                            % (mulitiline strings)
6015    morecomment=[s]{"""}{"""},% added by Philipp Matthias Hahn
```

Jürgen Dietel provided an example with a wrong representation of documentation strings, so the two lines above got changed from `morestring` → `morecomment`.

Python now supports so called *raw strings* and also Unicode strings. Here is the definition of these strings:

```
6016    morestring=[s]{r'}{'},% 'raw' strings
6017    morestring=[s]{r"}{"},%
6018    morestring=[s]{r'''}{'''},%
6019    morestring=[s]{r"""}{"""},%
6020    morestring=[s]{u'}{'},% unicode strings
6021    morestring=[s]{u"}{"},%
6022    morestring=[s]{u'''}{'''},%
6023    morestring=[s]{u"""}{"""}%
6024 }%
```

Philipp Matthias Hahn added the third comment. eRreuR found a bug using Python and Nicolas Markey informed me about the corresponding thread on `fr.comp.text.tex` and provided the fix—adding `[b]` to both `morestring` declarations.

```
6025 ⟨/lang1⟩
```

Alexis Dimitriadis also proposes the following configuration for printing Python code which simulates colorizing the code as it's done by the IDLE GUI:

```
6026 ⟨*python-prf⟩

6027 \usepackage{xcolor}
6028 \usepackage{textcomp}
6029
6030 %% Actual colors from idlelib/config-highlight.def
6031 %%     --> corrected to ''web-safe''
6032 %% strings  = #00aa00 / 0,170,0     (a darker green)
6033 %% builtins = #900090 / 144,0,144    (purple-ish)
6034 %% keywords = #FF7700 / 255,119,0    (quite close to plain 'orange')
6035 %\definecolor{IDLEorange}{RGB}{255,119,0} % pretty close to real orange
6036 %\definecolor{IDLEpurple}{RGB}{144,0,144}
6037 %\definecolor{IDLEgreen}{RGB}{0,170,0}
6038 %\definecolor{IDLEred}{RGB}{221,0,0}
6039 %% Corrected to ''web-safe''
```

```
6040 %\definecolor{orange2}{RGB}{255,102,0}
6041 \definecolor{purple2}{RGB}{153,0,153} % there's actually no standard purple
6042 \definecolor{green2}{RGB}{0,153,0} % a darker green
6043 %\definecolor{red2}{RGB}{221,0,0}
6044
6045 % Except for green and purple, the other colors are pretty good in standard
6046 % hue
6047 \lstdefinestyle{python-idle-code}{%
6048   language=Python,                    % the language
6049   basicstyle=\normalsize\ttfamily,    % size of the fonts for the code
6050   % Color settings to match IDLE style
6051   keywordstyle=\color{orange},        % core keywords
6052   keywordstyle={[2]\color{purple2}},  % built-ins
6053   stringstyle=\color{green2},%
6054   commentstyle=\color{red},%
6055   upquote=true,                       % requires textcomp
6056 }
6057 % Unimplemented IDLE syntax: function/class names being defined should be
6058 % blue
```

This code is provided in the file `listings-python.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
6059 ⟨/python-prf⟩
```

2.67 Rexx

Patrick TJ McPhee provided this definition.

```
6060 ⟨*lang2⟩
```

```
6061 %%
6062 %% classic rexx listings definition
6063 %% by Patrick TJ McPhee <ptjm@interlog.com>
6064 %%
6065 \lst@definelanguage{Rexx}
6066   {morekeywords={address,arg,call,do,drop,else,end,exit,if,iterate,%
6067                  interpret,leave,nop,numeric,options,otherwise,parse,%
6068                  procedure,pull,push,queue,return,say,signal,then,to,%
6069                  trace,when},%
6070   sensitive=false,%
6071   morecomment=[n]{/*}{*/},%
6072   morestring=[d]{'},%
6073   morestring=[d]{"},%
6074   }[keywords,comments,strings]%
```

```
6075 ⟨/lang2⟩
```

There are two dialects of Rexx: the one from System Product Interpreter Reference, VM/XA SP Release 1 and Release 2 and the modern version ooRexx (see http://www.oorexx.org/).

2.67.1 Rexx—VM/XA

```
6076 ⟨*lang2⟩
```

```
6077 %%
6078 %% REXX keywords from System Product Interpreter Reference, VM/XA SP Release 1
```

```
6079 %% and Release 2
6080 \lst@definelanguage[VM/XA]{Rexx}[]{Rexx}{%
6081   morekeywords={all,by,digits,commands,end,engineering,error,errors,expose,%
6082     external,for,form,fuzz,halt,labels,intermediates,negative,normal,novalue,%
6083     on,off,results,scan,scientific,select,source,stream,syntax,until,upper,%
6084     value,var,version,while,with},%
6085   ndkeywords={abbrev,abs,address,bitand,bitor,bitxor,center,centre,%
6086     compare,copies,c2d,c2x,datatype,date,delstr,delword,diag,diagrc,%
6087     d2c,d2x,errortext,externals,find,format,index,insert,justify,%
6088     lastpos,left,length,linesize,max,min,overlay,pos,queued,random,%
6089     reverse,rigth,sign,sourceline,space,storage,strip,substr,subword,%
6090     symbol,time,translate,trunc,userid,value,verify,word,wordindex,%
6091     wordlength,words,xrange,x2c,x2d},%
6092   sensitive=false,%
6093   morestring=[d]",%
6094   morestring=[d]',%
6095   morecomment=[s]{/*}{*/},%
6096   alsoletter={:},%
6097 }[keywords,comments,strings]%

6098 ⟨/lang2⟩
```

2.67.2   ooRexx

```
6099 ⟨*lang2⟩

6100 %%
6101 %% ooREXX keywords (http://www.oorexx.org/)
6102 \lst@definelanguage[]{OORexx}[VM/XA]{Rexx}{%
6103   morekeywords={::class, ::method, ::attribute},%
6104 }

6105 ⟨/lang2⟩
```

2.68   Reduce

was provided by Geraint Paul Bevan.

```
6106 ⟨*lang3⟩

6107 %%
6108 %% Reduce definition (c) 2002 Geraint Paul Bevan
6109 %%
6110 \lst@definelanguage{Reduce}%
6111   {morekeywords={%
6112 %% reserved identifiers
6113 abs,acos,acosh,acot,acoth,acsc,acsch,%
6114 adjprec,algebraic,algint,allbranch,allfac,and,%
6115 antisymmetric,append,arglength,array,asec,asech,%
6116 asin,asinh,atan,atan2,atanh,begin,bfspace,bye,%
6117 card_no,ceiling,clear,clearrules,coeff,coeffn,%
6118 cofactor,combineexpt,combinelogs,comment,comp,%
6119 complex,conj,cons,cont,cos,cosh,cot,coth,cramer,%
6120 cref,csc,csch,decompose,define,defn,deg,demo,den,%
6121 depend,det,df,difference,dilog,display,div,do,e,%
6122 echo,ed,editdef,ei,end,eps,eq,equal,erf,errcont,%
6123 evallhseqp,eval_mode,even,evenp,exp,expandlogs,%
6124 expr,expt,ezgcd,factor,factorial,factorize,fexpr,%
6125 first,fix,fixp,floor,for,forall,foreach,fort,%
```

131

```
6126 fort_width,freeof,fullroots,g,gcd,geq,go,goto,%
6127 greaterp,high_pow,hypot,i,if,ifactor,impart,in,%
6128 index,infinity,infix,input,int,integer,interpol,%
6129 intstr,k,korder,lambda,lcm,lcof,length,leq,lessp,%
6130 let,lhs,linear,linelength,lisp,list,listargp,%
6131 listargs,ln,load,load_package,log,log10,logb,%
6132 low_pow,lterm,macro,mainvar,mass,mat,match,%
6133 mateigen,matrix,max,mcd,member,memq,min,minus,mkid,%
6134 modular,msg,mshell,multiplicities,nat,neq,nero,%
6135 nextprime,nil,nodepend,noncom,nonzero,nosplit,%
6136 nospur,nullspace,num,numberp,odd,off,on,operator,%
6137 or,order,ordp,out,output,part,pause,period,pf,pi,%
6138 plus,precedence,precise,precision,pret,pri,primep,%
6139 print_precision,procedure,product,quit,quotient,%
6140 random,random_new_seed,rank,rat,ratarg,rational,%
6141 rationalize,ratpri,real,rederr,reduct,remainder,%
6142 remfac,remind,repart,repeat,rest,resultant,retry,%
6143 return,reverse,revpri,rhs,rlisp88,%
6144 root_multiplicity,round,roundall,roundbf,rounded,%
6145 saveas,savestructr,scalar,sec,sech,second,set,%
6146 setmod,setq,share,showrules,showtime,shut,sign,sin,%
6147 sinh,smacro,solve,solvesingular,spur,sqrt,structr,%
6148 sub,sum,symbolic,symmetric,t,tan,tanh,third,time,%
6149 times,tp,tra,trace,trfac,trigform,trint,until,%
6150 varname,vecdim,vector,weight,when,where,while,%
6151 write,ws,wtlevel,%
6152 %% identifiers with spaces
6153 %% for all,for each,go to,such that,%
6154 },%
6155   sensitive=false,%
6156   morecomment=[l]\%,%
6157   morecomment=[s]{COMMENT}{;},%
6158   morecomment=[s]{COMMENT}{$},%
6159   morestring="%
6160  }[keywords,comments,strings]%

6161 ⟨/lang3⟩
```

2.69   RSL

Thanks go to Brian Christensen.

```
6162 ⟨*lang3⟩

6163 %%
6164 %% RSL definition (c) 2004 Brian Christensen
6165 %%
6166 \lst@definelanguage{RSL}%
6167   {morekeywords={Bool,Char,devt_relation,Int,Nat,Real,Text,Unit,abs,any,%
6168       as,axiom,card,case,channel,chaos,class,do,dom,elems,else,elsif,end,%
6169       extend,false,for,hd,hide,if,in,inds,initialise,int,len,let,local,%
6170       object,of,out,post,pre,read,real,rng,scheme,skip,stop,swap,%
6171       test_case,theory,then,tl,true,type,until,use,value,variable,while,%
6172       with,write},%
6173 literate=%
6174 {<}{$<$}{1}%
```

```
6175 {>}{$>$}{1}%
6176 {[}{$[$}{1}%%
6177 {]}{$]$}{1}%%
6178 {^}{{\mbox{$\widehat{\;}$}}}{1}%%
6179 {'}{{\raisebox{1ex}[1ex][0ex]{\protect\scriptsize$\prime$}}}{1}%%
6180 {||}{{\mbox{$\parallel$}}}{2}%%
6181 {|-}{$\vdash$}{1}%%
6182 {|=|}{{\mbox{$\lceil\!\rceil\!\!\!\!\!\!\;\lfloor\!\rfloor$}}}{1}%%
6183 {**}{$\uparrow$}{1}%
6184 {/\\}{$\wedge$}{1}%%
6185 {inter}{$\cap$}{1}%%
6186 {-\\}{$\lambda$}{1}%%
6187 {->}{$\rightarrow$}{1}%%
6188 {-m->}{{\mbox{$\rightarrow \hspace{-2.5\lst@width} _{m}\;$}}}{1}%
6189 {-~m->}{{\mbox{$\stackrel{\sim}{\mbox{$\rightarrow%
6190          \hspace{-2.5\lst@width} _{m}\;$}}$}}}{1}%%
6191 {-~->}{{\mbox{$\stackrel{\sim}{\rightarrow}$}}}{1}%%
6192 {-set}{\bf{-set}}{4}%%
6193 {-list}{{$^{\ast}$}}{1}%%
6194 {-inflist}{$^\omega$}{1}%
6195 {-infset}{{\mbox{{\bf -infset}}}}{7}%
6196 {\#}{$\circ$}{1}%
6197 {:-}{{\raisebox{.4ex}{\tiny $\bullet$}}}{1}%%
6198 {=}{$=$}{1}%%
6199 {==}{$==$}{2}%%
6200 {=>}{$\Rightarrow$}{1}%%
6201 {\ is\protect\^^M}{{$\;\equiv$}}{2}%
6202 {\ is\ }{{$\equiv$}}{3}%%
6203 {\ isin\protect\^^M}{$\;\in$}{2}%%
6204 {~}{$\sim$}{1}%%
6205 {~=}{$\neq$}{1}%%
6206 {~isin}{$\notin$}{1}%%
6207 {+>}{$\mapsto$}{1}%%
6208 {++}{}{1}%
6209 {|^|}{{\mbox{$\lceil\!\rceil$}}}{1}%%
6210 {\\/}{$\vee$}{1}%%
6211 {exists}{$\exists$}{1}%%
6212 {union}{$\cup$}{1}%%
6213 {>=}{$\geq$}{1}%%
6214 {><}{$\times$}{1}%%
6215 {>>}{$\supset$}{1}%
6216 {>>=}{$\supseteq$}{1}%%
6217 {<=}{$\leq$}{1}%%
6218 {<<}{$\subset$}{1}%
6219 {<.}{$\langle$}{1}%%
6220 {<<=}{$\subseteq$}{1}%%
6221 {<->}{$\leftrightarrow$}{1}%%
6222 {[=}{$\sqsubseteq$}{1}%%
6223 {\{=}{$\preceq$}{1}%%
6224 {\ all\protect\^^M}{$\forall$}{2}%%
6225 {\ all\ }{$\forall$}{3}%%
6226 {!!}{$\dagger$}{1}%%
6227 {always}{$\Box$}{1}%%
6228 {.>}{$\rangle$}{1}%%
```

```
6229 {`alpha}{$\alpha$}{1}%
6230 {`beta}{$\beta$}{1}%
6231 {`gamma}{$\gamma$}{1}%
6232 {`delta}{$\delta$}{1}%
6233 {`epsilon}{$\epsilon$}{1}%
6234 {`zeta}{$\zeta$}{1}%
6235 {`eta}{$\eta$}{1}%
6236 {`theta}{$\theta$}{1}%
6237 {`iota}{$\iota$}{1}%
6238 {`kappa}{$\kappa$}{1}%
6239 {`mu}{$\mu$}{1}%
6240 {`nu}{$\nu$}{1}%
6241 {`xi}{$\xi$}{1}%
6242 {`pi}{$\pi$}{1}%
6243 {`rho}{$\rho$}{1}%
6244 {`sigma}{$\sigma$}{1}%
6245 {`tau}{$\tau$}{1}%
6246 {`upsilon}{$\upsilon$}{1}%
6247 {`phi}{$\phi$}{1}%
6248 {`chi}{$\chi$}{1}%
6249 {`psi}{$\psi$}{1}%
6250 {`omega}{$\omega$}{1}%
6251 {`Gamma}{$\Gamma$}{1}%
6252 {`Delta}{$\Delta$}{1}%
6253 {`Theta}{$\Theta$}{1}%
6254 {`Lambda}{$\Lambda$}{1}%
6255 {`Xi}{$\Xi$}{1}%
6256 {`Pi}{$\Pi$}{1}%
6257 {`Sigma}{$\Sigma$}{1}%
6258 {`Upsilon}{$\Upsilon$}{1}%
6259 {`Phi}{$\Phi$}{1}%
6260 {`Psi}{$\Psi$}{1}%
6261 {`Omega}{$\Omega$}{1},%
6262    sensitive=true,%
6263    morecomment=[l]{--},%
6264    morecomment=[s]{/*}{*/}%
6265   }[keywords,comments]%

6266 ⟨/lang3⟩
```

2.70 Ruby

Christian Kaiser provided the initial definition. Xavier Noria replaced the keywords with the keywords from the at the time of writing current stable Ruby version. An erroneous string delimiter was removed following a bug reported on comp.text.tex on 2006/09/01.

Ruby supports string delimiters of the form %q!...!, where ! can be any character, or can be matched braces or parentheses or brackets. The included string definitions include most of the common variants, but are of course not comprehensive.

```
6267 ⟨*lang2⟩

6268 \lst@definelanguage{Ruby}%
6269   {morekeywords={__FILE__,__LINE__,BEGIN,END,alias,and,begin,break,%
```

```
6270        case,class,def,defined?,do,else,elsif,end,ensure,false,for,%
6271        if,in,module,next,nil,not,or,redo,rescue,retry,return,self,%
6272        super,then,true,undef,unless,until,when,while,yield},%
6273     sensitive=true,%
6274     morecomment=[l]\#,%
6275     morecomment=[l]\#\#,%
6276     morecomment=[s]{=BEGIN}{=END},%
6277     morestring=[b]',%
6278     morestring=[b]",%
6279     morestring=[s]{\%q/}{/},%
6280     morestring=[s]{\%q!}{!},%
6281     morestring=[s]{\%q\{}{\}},%
6282     morestring=[s]{\%q(}{)},%
6283     morestring=[s]{\%q[}{]},%
6284     morestring=[s]{\%q-}{-},%
6285     morestring=[s]{\%Q/}{/},%
6286     morestring=[s]{\%Q!}{!},%
6287     morestring=[s]{\%Q\{}{\}},%
6288     morestring=[s]{\%Q(}{)},%
6289     morestring=[s]{\%Q[}{]},%
6290     morestring=[s]{\%Q-}{-}%
6291   }[keywords,comments,strings]%
6292 %     \begin{macrocode}
6293 ⟨/lang2⟩
```

2.71 Scilab

Thanks go to Jean-Philippe Grivet.

```
6294 ⟨*lang1⟩

6295 %%
6296 %% Scilab definition (c) 2002,2003 Jean-Philippe Grivet
6297 %%
6298 \lst@definelanguage{Scilab}%
6299   {morekeywords={abcd,abinv,abort,abs,acoshm,acosh,acosm,acos,addcolor,%
6300        addf,addinter,addmenu,add_edge,add_node,adj2sp,adj_lists,aff2ab,%
6301        amell,analpf,analyze,ans,apropos,arc_graph,arc_number,argn,arhnk,%
6302        arl2,arma2p,armac,armax1,armax,arma,arsimul,artest,articul,ascii,%
6303        asinhm,asinh,asinm,asin,atanhm,atanh,atanm,atan,augment,auread,%
6304        auwrite,balanc,balreal,bandwr,basename,bdiag,besseli,besselj,%
6305        besselk,bessely,best_match,bezout,bifish,bilin,binomial,black,%
6306        bloc2exp,bloc2ss,bode,bool2s,boolean,boucle,break,bstap,buttmag,%
6307        bvode,cainv,calerf,calfrq,call,canon,casc,case,ccontrg,cdfbet,%
6308        cdfbin,cdfchi,cdfchn,cdffnc,cdff,cdfgam,cdfnbn,cdfnor,cdfpoi,%
6309        cdft,ceil,center,cepstrum,chaintest,chain_struct,champ1,champ,%
6310        chart,chdir,cheb1mag,cheb2mag,check_graph,check_io,chepol,chfact,%
6311        chol,chsolve,circuit,classmarkov,clean,clearfun,clearglobal,%
6312        clear,close,cls2dls,cmb_lin,cmndred,cmoment,code2str,coeff,coffg,%
6313        coff,colcompr,colcomp,colinout,colormap,colregul,companion,comp,%
6314        cond,conj,connex,contour2di,contour2d,contourf,contour,%
6315        contract_edge,contrss,contr,cont_frm,cont_mat,convex_hull,convol,%
6316        convstr,con_nodes,copfac,copy,correl,corr,coshm,cosh,cosm,cos,%
6317        cotg,cothm,coth,covar,csim,cspect,ctr_gram,cumprod,cumsum,%
6318        curblock,cycle_basis,czt,c_link,dasrt,dassl,datafit,date,dbphi,%
```

135

```
6319    dcf,ddp,debug,dec2hex,deff,definedfields,degree,delbpt,%
6320    delete_arcs,delete_nodes,delete,delip,delmenu,demos,denom,%
6321    derivative,derivat,des2ss,des2tf,determ,detr,det,dft,dhinf,%
6322    dhnorm,diag,diary,diff,diophant,dirname,dispbpt,dispfiles,disp,%
6323    dlgamma,double,dragrect,drawaxis,drawlater,drawnow,draw,driver,%
6324    dscr,dsearch,dsimul,dtsi,dt_ility,duplicate,edge_number,%
6325    edit_curv,edit_graph_menus,edit_graph,edit,eigenmarkov,ell1mag,%
6326    elseif,else,emptystr,endfunction,end,eqfir,eqiir,equil1,equil,%
6327    ereduc,erfcx,erfc,erf,errbar,errcatch,errclear,error,eval3dp,%
6328    eval3d,eval,evans,evstr,excel2sci,execstr,exec,exists,exit,expm,%
6329    exp,external,eye,fac3d,factors,faurre,fchamp,fcontour2d,fcontour,%
6330    fec,feedback,feval,ffilt,fftshift,fft,fgrayplot,figure,fileinfo,%
6331    file,filter,findm,findobj,findx0BD,find_freq,find_path,find,%
6332    findABCD,findAC,findBD,findBDK,findR,fit_dat,fix,floor,flts,foo,%
6333    formatman,format,fort,for,fourplan,fplot2d,fplot3d1,fplot3d,%
6334    fprintf,fprintfMat,frep2tf,freq,freson,frexp,frfit,frmag,fscanf,%
6335    fscanfMat,fsfirlin,fsolve,fspecg,fstabst,fstair,ftest,ftuneq,%
6336    fullrfk,fullrf,full,fun2string,funcprot,functions,function,%
6337    funptr,fusee,gainplot,gamitg,gammaln,gamma,gcare,gcd,gcf,%
6338    genfac3d,genlib,genmarkov,gen_net,geom3d,geomean,getblocklabel,%
6339    getcolor,getcurblock,getcwd,getdate,getd,getenv,getfield,getfont,%
6340    getf,getio,getlinestyle,getmark,getpid,getscicosvars,getsymbol,%
6341    getvalue,getversion,get_function_path,get,gfare,gfrancis,girth,%
6342    givens,glever,glist,global,glue,gpeche,graduate,grand,%
6343    graphics_entities,graph_2_mat,graph_center,graph_complement,%
6344    graph_diameter,graph_power,graph_simp,graph_sum,graph_union,%
6345    graph-list,graycolormap,grayplot,graypolarplot,grep,group,%
6346    gr_menu,gschur,gsort,gspec,gstacksize,gtild,g_margin,h2norm,halt,%
6347    hamilton,hankelsv,hank,harmean,havewindow,help,hermit,hess,%
6348    hex2dec,hilb,hinf,hist3d,histplot,horner,host,hotcolormap,%
6349    householder,hrmt,htrianr,hypermat,h_cl,h_inf_st,h_inf,h_norm,%
6350    iconvert,icon_edit,ieee,if,iirgroup,iirlp,iir,ilib_build,%
6351    ilib_compile,ilib_for_link,ilib_gen_gateway,ilib_gen_loader,%
6352    ilib_gen_Make,imag,impl,imrep2ss,imult,im_inv,inistate,input,%
6353    int16,int2d,int32,int3d,int8,intc,intdec,integrate,interpln,%
6354    interp,intersci,intersect,intg,intl,intppty,intsplin,inttrap,%
6355    inttype,int,invr,invsyslin,inv_coeff,inv,iqr,isdef,isdir,isequal,%
6356    iserror,isglobal,isinf,isnan,isoview,isreal,is_connex,jmat,%
6357    justify,kalm,karmarkar,kernel,keyboard,knapsack,kpure,krac2,%
6358    kroneck,kron,lasterror,lattn,lattp,lcf,lcmdiag,lcm,ldivf,ldiv,%
6359    leastsq,legends,length,leqr,levin,lev,lex_sort,lft,lgfft,library,%
6360    lib,lin2mu,lincos,lindquist,lines,line_graph,linfn,linf,link,%
6361    linmeq,linpro,linsolve,linspace,lin,listfiles,list,lmisolver,%
6362    lmitool,loadmatfile,loadplots,loadwave,load_graph,load,locate,%
6363    log10,log1p,log2,logm,logspace,log,lotest,lqe,lqg2stan,lqg_ltr,%
6364    lqg,lqr,lsq,lsslist,lstcat,lstsize,ltitr,ludel,lufact,luget,%
6365    lusolve,lu,lyap,macglov,macr2lst,macrovar,macro,mad,make_graph,%
6366    make_index,manedit,man,mapsound,markp2ss,matfile2sci,matrix,%
6367    mat_2_graph,maxi,max_cap_path,max_clique,max_flow,max,mclearerr,%
6368    mclose,meanf,mean,median,meof,mese,mesh2d,mfft,mfile2sci,mgeti,%
6369    mgetl,mgetstr,mget,milk_drop,mine,mini,minreal,minss,%
6370    min_lcost_cflow,min_lcost_flow1,min_lcost_flow2,min_qcost_flow,%
6371    min_weight_tree,min,mlist,mode,modulo,moment,mopen,move,%
6372    mps2linpro,mputl,mputstr,mput,mrfit,msd,mseek,mtell,mtlb_load,%
```

```
6373        mtlb_mode,mtlb_save,mtlb_sparse,mu2lin,mulf,mvvacov,m_circle,%
6374        names,nand2mean,nanmax,nanmeanf,nanmean,nanmedian,nanmin,%
6375        nanstdev,nansum,narsimul,ndims,nearfloat,nehari,neighbors,%
6376        netclose,netwindows,netwindow,newest,newfun,nextpow2,nf3d,nfreq,%
6377        nlev,nnz,nodes_2_path,nodes_degrees,node_number,noisegen,norm,%
6378        null,numdiff,numer,nyquist,obscont1,obscont,observer,obsvss,%
6379        obsv_mat,obs_gram,odedc,odedi,odeoptions,ode_discrete,ode_root,%
6380        ode,oldload,oldsave,ones,optim,orth,param3d1,param3d,%
6381        paramfplot2d,parrot,part,pathconvert,path_2_nodes,pause,pbig,%
6382        pdiv,pen2ea,pencan,penlaur,perctl,perfect_match,pertrans,pfss,%
6383        phasemag,phc,pinv,pipe_network,playsnd,plot2d1,plot2d2,plot2d3,%
6384        plot2d4,plot2d,plot3d1,plot3d2,plot3d3,plot3d,plotframe,%
6385        plotprofile,plot_graph,plot,plzr,pmodulo,pol2des,pol2str,pol2tex,%
6386        polarplot,polar,polfact,poly,portr3d,portrait,power,ppol,prbs_a,%
6387        predecessors,predef,printf,printing,print,prod,profile,projsl,%
6388        projspec,proj,psmall,pspect,pvm_addhosts,pvm_barrier,pvm_bcast,%
6389        pvm_bufinfo,pvm_config,pvm_delhosts,pvm_error,pvm_exit,%
6390        pvm_f772sci,pvm_getinst,pvm_gettid,pvm_get_timer,pvm_gsize,%
6391        pvm_halt,pvm_joingroup,pvm_kill,pvm_lvgroup,pvm_mytid,pvm_parent,%
6392        pvm_probe,pvm_recv,pvm_reduce,pvm_sci2f77,pvm_send,pvm_set_timer,%
6393        pvm_spawn_independent,pvm_spawn,pvm_start,pvm_tasks,%
6394        pvm_tidtohost,pvm,pwd,p_margin,qassign,qr,quapro,quart,quaskro,%
6395        quit,randpencil,rand,range,rankqr,rank,rat,rcond,rdivf,read4b,%
6396        readb,readc_,readmps,read,real,recur,reglin,regress,remezb,remez,%
6397        repfreq,replot,residu,resume,return,riccati,riccsl,ricc,ric_desc,%
6398        rlist,roots,rotate,round,routh_t,rowcompr,rowcomp,rowinout,%
6399        rowregul,rowshuff,rpem,rref,rtitr,rubberbox,salesman,savewave,%
6400        save_graph,save,scaling,scanf,schur,sci2exp,sci2for,sci2map,%
6401        sciargs,scicosim,scicos,scifunc_block,sd2sci,secto3d,select,%
6402        semidef,sensi,setbpt,seteventhandler,setfield,setmenu,%
6403        setscicosvars,set,sfact,sgrid,shortest_path,showprofile,%
6404        show_arcs,show_graph,show_nodes,sident,signm,sign,simp_mode,simp,%
6405        sincd,sinc,sinc,sinhm,sinh,sinm,sin,size,sm2des,sm2ss,smooth,%
6406        solve,sorder,sort,sound,sp2adj,spaninter,spanplus,spantwo,sparse,%
6407        spchol,spcompack,specfact,spec,speye,spget,splin,split_edge,%
6408        spones,sprand,sprintf,spzeros,sqroot,sqrtm,sqrt,squarewave,%
6409        square,srfaur,srkf,ss2des,ss2ss,ss2tf,sscanf,sskf,ssprint,ssrand,%
6410        stabil,stacksize,standard_define,standard_draw,standard_input,%
6411        standard_origin,standard_output,startup,stdevf,stdev,steadycos,%
6412        str2code,strange,strcat,strindex,strings,string,stripblanks,%
6413        strong_connex,strong_con_nodes,strsubst,st_deviation,st_ility,%
6414        subf,subgraph,subplot,successors,sum,supernode,sva,svd,svplot,%
6415        sylm,sylv,sysconv,sysdiag,sysfact,syslin,syssize,systems,system,%
6416        systmat,tabul,tangent,tanhm,tanh,tanm,tan,tdinit,testmatrix,%
6417        texprint,tf2des,tf2ss,then,thrownan,timer,time_id,titlepage,%
6418        tk_getdir,tk_getfile,tlist,toeplitz,tokenpos,tokens,trace,%
6419        translatepaths,trans_closure,trans,trfmod,trianfml,tril,trimmean,%
6420        trisolve,triu,trzeros,typename,typeof,type,uicontrol,uimenu,%
6421        uint16,uint32,uint8,ui_observer,ulink,unglue,union,unique,unix_g,%
6422        unix_s,unix_w,unix_x,unix,unobs,unsetmenu,user,varargin,%
6423        varargout,variancef,variance,varn,warning,wavread,wavwrite,%
6424        wcenter,wfir,what,whereami,whereis,where,while,whos,who_user,who,%
6425        wiener,wigner,window,winsid,with_gtk,with_pvm,with_texmacs,%
6426        with_tk,writb,write4b,write,xarcs,xarc,xarrows,xaxis,xbasc,%
```

137

```
6427        xbasimp,xbasr,xchange,xclear,xclea,xclick,xclip,xdel,xend,xfarcs,%
6428        xfarc,xfpolys,xfpoly,xfrect,xgetech,xgetfile,xgetmouse,xget,%
6429        xgraduate,xgrid,xinfo,xinit,xlfont,xload,xname,xnumb,xpause,%
6430        xpolys,xpoly,xrects,xrect,xrpoly,xs2fig,xs2gif,xs2ppm,xs2ps,%
6431        xsave,xsegs,select,xsetech,xsetm,xset,xstringb,xstringl,xstring,%
6432        xtape,xtitle,x_choices,x_choose,x_dialog,x_matrix,x_mdialog,%
6433        x_message_modeless,x_message,yulewalk,zeropen,zeros,zgrid,zpbutt,%
6434        zpch1,zpch2,zpell,mfprintf,mfscanf,mprintf,mscanf,msprintf,%
6435        msscanf,mucomp,%
6436        ABSBLK_f,AFFICH_f,ANDLOG_f,ANIMXY_f,BIGSOM_f,CLINDUMMY_f,CLKIN_f,%
6437        CLKINV_f,CLKOUT_f,CLKOUTV_f,CLKSOM_f,CLKSOMV_f,CLKSPLIT_f,%
6438        CLOCK_f,CLR_f,CLSS_f,CONST_f,COSBLK_f,CURV_f,DELAY_f,DELAYV_f,%
6439        DEMUX_f,DLR_f,DLRADAPT_f,DLSS_f,EVENTSCOPE_f,EVTDLY_f,EVTGEN_f,%
6440        EXPBLK_f,G_make,GAIN_f,GAINBLK_f,GENERAL_f,GENERIC_f,GENSIN_f,%
6441        GENSQR_f,HALT_f,IFTHEL_f,IN_f,INTEGRAL_f,INTRP2BLK_f,INTRPLBLK_f,%
6442        INVBLK_f,LOGBLK_f,LOOKUP_f,Matplot1,Matplot,MAX_f,MCLOCK_f,%
6443        MFCLCK_f,MIN_f,MUX_f,NDcost,NEGTOPOS_f,OUT_f,POSTONEG_f,POWBLK_f,%
6444        PROD_f,QUANT_f,RAND_f,READC_f,REGISTER_f,RELAY_f,RFILE_f,%
6445        ScilabEval,Sfgrayplot,Sgrayplot,SAMPLEHOLD_f,SAT_f,SAWTOOTH_f,%
6446        SCOPE_f,SCOPXY_f,SELECT_f,SINBLK_f,SOM_f,SPLIT_f,STOP_f,SUPER_f,%
6447        TANBLK_f,TCLSS_f,TEXT_f,TIME_f,TK_EvalFile,TK_EvalStr,TK_GetVar,%
6448        TK_SetVar,TRASH_f,WFILE_f,WRITEC_f,ZCROSS_f,%
6449        \%asn,\%helps,\%k,\%sn},%
6450    alsoletter=\%,% chmod
6451    sensitive,%
6452    morecomment=[l]//,%
6453    morestring=[b]",%
6454    morestring=[m]'%
6455    }[keywords,comments,strings]%

6456 ⟨/lang1⟩
```

2.72 SHELXL

Thanks to Aidan Philip Heerdegen for mailing this definition.

```
6457 ⟨*lang2⟩

6458 %%
6459 %% SHELXL definition (c) 1999 Aidan Philip Heerdegen
6460 %%
6461 \lst@definelanguage{SHELXL}%
6462   {morekeywords={TITL,CELL,ZERR,LATT,SYMM,SFAC,DISP,UNIT,LAUE,%
6463       REM,MORE,TIME,END,HKLF,OMIT,SHEL,BASF,TWIN,EXTI,SWAT,%
6464       MERG,SPEC,RESI,MOVE,ANIS,AFIX,HFIX,FRAG,FEND,EXYZ,EADP,%
6465       EQIV,OMIT,CONN,PART,BIND,FREE,DFIX,BUMP,SAME,SADI,CHIV,%
6466       FLAT,DELU,SIMU,DEFS,ISOR,SUMP,L.S.,CGLS,SLIM,BLOC,DAMP,%
6467       WGHT,FVAR,BOND,CONF,MPLA,RTAB,LIST,ACTA,SIZE,TEMP,WPDB,%
6468       FMAP,GRID,PLAN,MOLE},%
6469   sensitive=false,%
6470   alsoother=_,% Makes the syntax highlighting ignore the underscores
6471   morecomment=[l]{! },%
6472   }%

6473 ⟨/lang2⟩
```

138

2.73 Simula

Took data from

- GÜNTHER LAMPRECHT: **Introduction to SIMULA 67**; Braunschweig; Wiesbaden: Vieweg, 1981

6474 ⟨∗lang3⟩

6475 \lst@definelanguage[IBM]{Simula}[DEC]{Simula}{}%

6476 \lst@definelanguage[DEC]{Simula}[67]{Simula}%
6477   {morekeywords={and,eq,eqv,ge,gt,hidden,imp,le,long,lt,ne,not,%
6478   options,or,protected,short}%
6479   }%

6480 \lst@definelanguage[CII]{Simula}[67]{Simula}%
6481   {morekeywords={and,equiv,exit,impl,not,or,stop}}%

6482 \lst@definelanguage[67]{Simula}%
6483   {morekeywords={activate,after,array,at,before,begin,boolean,%
6484   character,class,comment,delay,detach,do,else,end,external,false,%
6485   for,go,goto,if,in,inner,inspect,integer,is,label,name,new,none,%
6486   notext,otherwise,prior,procedure,qua,reactivate,real,ref,resume,%
6487   simset,simulation,step,switch,text,then,this,to,true,until,value,%
6488   virtual,when,while},%
6489   sensitive=f,%
6490   keywordcommentsemicolon={end}{else,end,otherwise,when}{comment},%
6491   morestring=[d]",%
6492   morestring=[d]'%
6493   }[keywords,keywordcomments,strings]%

6494 ⟨/lang3⟩

2.74 SPARQL

This definition for the SPARQL query language (SPARQL Protocol and RDF Query Language, http://www.w3.org/TR/rdf-sparql-query/) was provided by Christoph Kiefer.

6495 ⟨∗lang3⟩

6496 %%
6497 %% SPARQL definition (c) 2006 Christoph Kiefer
6498 %%
6499 \lst@definelanguage{SPARQL}%
6500   {morekeywords={BASE,PREFIX,SELECT,DISTINCT,CONSTRUCT,DESCRIBE,ASK,%
6501   FROM,NAMED,WHERE,ORDER,BY,ASC,DESC,LIMIT,OFFSET,OPTIONAL,%
6502   GRAPH,UNION,FILTER,a,STR,LANG,LANGMATCHES,DATATYPE,BOUND,%
6503   isIRI,isURI,isBLANK,isLITERAL,REGEX,true,false},%
6504   sensitive=false,%
6505   morecomment=[l]\#,%
6506   morestring=[d]',%
6507   morestring=[d]"%
6508   }[keywords,comments,strings]%

6509 ⟨/lang3⟩

2.75 SQL

Data come from Christian Haul. Neil Conway added some keywords, ditto Torsten Flatter, Robert Frank and Dirk Jesko. Hilmar Preuße informed about an issue mentioned at https://bugs.debian.org/626521, the issue got corrected.

```
6510 ⟨*lang1⟩

6511 %%
6512 %% SQL definition (c) 1998 Christian Haul
6513 %%                  (c) 2002 Neil Conway
6514 %%                  (c) 2002 Robert Frank
6515 %%                  (c) 2003 Dirk Jesko
6516 %%
6517 \lst@definelanguage{SQL}%
6518   {morekeywords={ABSOLUTE,ACTION,ADD,ALLOCATE,ALTER,ARE,AS,ASSERTION,%
6519       AT,BEGIN,BETWEEN,BIT_LENGTH,BOTH,BY,CASCADE,CASCADED,CASE,CAST,%
6520       CATALOG,CHAR_LENGTH,CHARACTER_LENGTH,CLUSTER,COALESCE,%
6521       COLLATE,COLLATION,COLUMN,CONNECT,CONNECTION,CONSTRAINT,%
6522       CONSTRAINTS,CONVERT,CORRESPONDING,CREATE,CROSS,CURRENT_DATE,%
6523       CURRENT_TIME,CURRENT_TIMESTAMP,CURRENT_USER,DAY,DEALLOCATE,%
6524       DEC,DEFERRABLE,DEFERED,DESCRIBE,DESCRIPTOR,DIAGNOSTICS,%
6525       DISCONNECT,DOMAIN,DROP,ELSE,END,EXEC,EXCEPT,EXCEPTION,EXECUTE,%
6526       EXTERNAL,EXTRACT,FALSE,FIRST,FOREIGN,FROM,FULL,GET,GLOBAL,%
6527       GRAPHIC,HAVING,HOUR,IDENTITY,IMMEDIATE,INDEX,INITIALLY,INNER,%
6528       INPUT,INSENSITIVE,INSERT,INTO,INTERSECT,INTERVAL,%
6529       ISOLATION,JOIN,KEY,LAST,LEADING,LEFT,LEVEL,LIMIT,LOCAL,LOWER,%
6530       MATCH,MINUTE,MONTH,NAMES,NATIONAL,NATURAL,NCHAR,NEXT,NO,NOT,NULL,%
6531       NULLIF,OCTET_LENGTH,ON,ONLY,ORDER,ORDERED,OUTER,OUTPUT,OVERLAPS,%
6532       PAD,PARTIAL,POSITION,PREPARE,PRESERVE,PRIMARY,PRIOR,READ,%
6533       RELATIVE,RESTRICT,REVOKE,RIGHT,ROWS,SCROLL,SECOND,SELECT,SESSION,%
6534       SESSION_USER,SIZE,SPACE,SQLSTATE,SUBSTRING,SYSTEM_USER,%
6535       TABLE,TEMPORARY,THEN,TIMEZONE_HOUR,%
6536       TIMEZONE_MINUTE,TRAILING,TRANSACTION,TRANSLATE,TRANSLATION,TRIM,%
6537       TRUE,UNIQUE,UNKNOWN,UPPER,USAGE,USING,VALUE,VALUES,%
6538       VARGRAPHIC,VARYING,WHEN,WHERE,WRITE,YEAR,ZONE,%
6539       AND,ASC,avg,CHECK,COMMIT,count,DECODE,DESC,DISTINCT,GROUP,IN,% FF
6540       LIKE,NUMBER,ROLLBACK,SUBSTR,sum,VARCHAR2,% FF
6541       MIN,MAX,UNION,UPDATE,% RF
6542       ALL,ANY,CUBE,CUBE,DEFAULT,DELETE,EXISTS,GRANT,OR,RECURSIVE,% DJ
6543       ROLE,ROLLUP,SET,SOME,TRIGGER,VIEW},% DJ
6544   morendkeywords={BIT,BLOB,CHAR,CHARACTER,CLOB,DATE,DECIMAL,FLOAT,% DJ
6545       INT,INTEGER,NUMERIC,SMALLINT,TIME,TIMESTAMP,VARCHAR},% moved here
6546   sensitive=false,% DJ
6547   morecomment=[l]--,%
6548   morecomment=[s]{/*}{*/},%
6549   morestring=[d]',%
6550   morestring=[d]"%
6551   }[keywords,comments,strings]%

6552 ⟨/lang1⟩
```

2.76 Swift

The definition for Swift was provided by Stefan Jager.

```
6553 ⟨*lang3⟩
```

```
6554 \lst@definelanguage{Swift}{%
6555   morekeywords={associatedtype,class,deinit,enum,extension,fileprivate,%
6556     func,import,init,inout,internal,let,open,operator,private,protocol,%
6557     public,static,struct,subscript,typealias,var,break,case,continue,%
6558     default,defer,do,else,fallthrough,for,guard,if,in,repeat,return,%
6559     switch,where,while,as,Any,catch,false,is,nil,rethrows,super,self,%
6560     Self,throw,throws,true,try,_,associativity,convenience,dynamic,%
6561     didSet,final,get,infix,indirect,lazy,left,mutating,none,%
6562     nonmutating,optional,override,postfix,precedence,prefix,Protocol,%
6563     required,right,set,Type,unowned,weak,willSet},%
6564   sensitive,%
6565   morecomment=[s]{/*}{*/},%
6566   morecomment=[s]{/**}{*/},%
6567   morecomment=[l]//,%
6568   morecomment=[l]///,%
6569   morestring=[b]",%
6570   morestring=[b]""",%
6571   moredelim=*[directive]\#,%
6572   moredirectives={available,colorLiteral,column,else,elseif,endif,file,%
6573     fileLiteral,function,if,imageLiteral,line,selector,sourceLocation}%
6574 }[keywords,comments,strings,directives]%

6575 ⟨/lang3⟩
```

2.77   Tcl/Tk

Tcl/Tk is a very dynamic language. A statical analysis might not be adequate. Nevertheless the following definitions produce the desired result for my programs with a minimum of "misses".

Data come from

- WELCH, BRENT B.: **Practical Programming in Tcl and Tk**; © 1997 Prentice Hall, Inc.; ISBN 0-13-616830-2.

- OUSTERHOUT, JOHN K.: **Tcl and the Tk Toolkit**; © 1997 Addison-Wesley Publishing Company; ISBN 0-201-6337-X.

Gerd Neugebauer added support for Tcl/Tk.

```
6576 ⟨*lang2⟩

6577 %%
6578 %% Tcl/Tk definition (c) Gerd Neugebauer
6579 %%
6580 \lst@definelanguage[tk]{tcl}[]{tcl}%
6581   {morekeywords={activate,add,separator,radiobutton,checkbutton,%
6582       command,cascade,all,bell,bind,bindtags,button,canvas,canvasx,%
6583       canvasy,cascade,cget,checkbutton,config,configu,configur,%
6584       configure,clipboard,create,arc,bitmap,image,line,oval,polygon,%
6585       rectangle,text,textwindow,curselection,delete,destroy,end,entry,%
6586       entrycget,event,focus,font,actual,families,measure,metrics,names,%
6587       frame,get,grab,current,release,status,grid,columnconfigure,%
6588       rowconfigure,image,image,create,bitmap,photo,delete,height,types,%
6589       widt,names,index,insert,invoke,itemconfigure,label,listbox,lower,%
6590       menu,menubutton,message,move,option,add,clear,get,readfile,pack,%
6591       photo,place,radiobutton,raise,scale,scroll,scrollbar,search,see,%
6592       selection,send,stdin,stdout,stderr,tag,bind,text,tk,tkerror,%
```

```
6593        tkwait,window,variable,visibility,toplevel,unknown,update,winfo,%
6594        class,exists,ismapped,parent,reqwidth,reqheight,rootx,rooty,%
6595        width,height,wm,aspect,client,command,deiconify,focusmodel,frame,%
6596        geometry,group,iconbitmap,iconify,iconmask,iconname,iconposition,%
6597        iconwindow,maxsize,minsize,overrideredirect,positionfrom,%
6598        protocol,sizefrom,state,title,transient,withdraw,xview,yview,%
6599        yposition,%
6600        -accelerator,-activebackground,-activeborderwidth,%
6601        -activeforeground,-after,-anchor,-arrow,-arrowshape,-aspect,%
6602        -async,-background,-before,-bg,-bigincrement,-bitmap,-bordermode,%
6603        -borderwidth,-button,-capstyle,-channel,-class,-closeenough,%
6604        -colormap,-column,-columnspan,-command,-confine,-container,%
6605        -count,-cursor,-data,-default,-detail,-digits,-direction,%
6606        -displayof,-disableforeground,-elementborderwidth,-expand,%
6607        -exportselection,-extend,-family,-fg,-file,-fill,-focus,-font,%
6608        -fontmap,-foreground,-format,-from,-gamma,-global,-height,%
6609        -highlightbackground,-highlightcolor,-highlightthickness,-icon,%
6610        -image,-in,-insertbackground,-insertborderwidth,-insertofftime,%
6611        -insertontime,-imsertwidth,-ipadx,-ipady,-joinstyle,-jump,%
6612        -justify,-keycode,-keysym,-label,-lastfor,-length,-maskdata,%
6613        -maskfile,-menu,-message,-mode,-offvalue,-onvalue,-orient,%
6614        -outlien,-outlinestipple,-overstrike,-override,-padx,-pady,%
6615        -pageanchor,-pageheight,-pagewidth,-pagey,-pagey,-palette,%
6616        -parent,-place,-postcommand,-relheight,-relief,-relwidth,-relx,%
6617        -rely,-repeatdelay,-repeatinterval,-resolution,-root,-rootx,%
6618        -rooty,-rotate,-row,-rowspan,-screen,-selectcolor,-selectimage,%
6619        -sendevent,-serial,-setgrid,-showvalue,-shrink,-side,-size,%
6620        -slant,-sliderlength,-sliderrelief,-smooth,-splinesteps,-state,%
6621        -sticky,-stipple,-style,-subsample,-subwindow,-tags,-takefocus,%
6622        -tearoff,-tearoffcommand,-text,-textvariable,-tickinterval,-time,%
6623        -title,-to,-troughcolor,-type,-underline,-use,-value,-variable,%
6624        -visual,-width,-wrap,-wraplength,-x,-xscrollcommand,-y,%
6625        -bgstipple,-fgstipple,-lmargin1,-lmargin2,-rmargin,-spacing1,%
6626        -spacing2,-spacing3,-tabs,-yscrollcommand,-zoom,%
6627        activate,add,addtag,bbox,cget,clone,configure,coords,%
6628        curselection,debug,delete,delta,deselect,dlineinfo,dtag,dump,%
6629        entrycget,entryconfigure,find,flash,fraction,get,gettags,handle,%
6630        icursor,identify,index,insert,invoke,itemcget,itemconfigure,mark,%
6631        moveto,own,post,postcascade,postscript,put,redither,ranges,%
6632        scale,select,show,tag,type,unpost,xscrollcommand,xview,%
6633        yscrollcommand,yview,yposition}%
6634    }%
6635 \lst@definelanguage[]{tcl}%
6636   {alsoletter={.:,*=&-},%
6637    morekeywords={after,append,array,names,exists,anymore,donesearch,%
6638        get,nextelement,set,size,startsearch,auto_mkindex,binary,break,%
6639        case,catch,cd,clock,close,concat,console,continue,default,else,%
6640        elseif,eof,error,eval,exec,-keepnewline,exit,expr,fblocked,%
6641        fconfigure,fcopy,file,atime,dirname,executable,exists,extension,%
6642        isdirectory,isfile,join,lstat,mtime,owned,readable,readlink,%
6643        rootname,size,stat,tail,type,writable,-permissions,-group,-owner,%
6644        -archive,-hidden,-readonly,-system,-creator,-type,-force,%
6645        fileevent,flush,for,foreach,format,gets,glob,global,history,if,%
6646        incr,info,argsbody,cmdcount,commands,complete,default,exists,%
```

```
6647         globals,level,library,locals,patchlevel,procs,script,tclversion,%
6648         vars,interp,join,lappend,lindex,linsert,list,llength,lrange,%
6649         lreplace,lsearch,-exact,-regexp,-glob,lsort,-ascii,-integer,%
6650         -real,-dictionary,-increasing,-decreasing,-index,-command,load,%
6651         namespace,open,package,forget,ifneeded,provide,require,unknown,%
6652         vcompare,versions,vsatisfies,pid,proc,puts,-nonewline,pwd,read,%
6653         regexp,-indices,regsub,-all,-nocasename,return,scan,seek,set,%
6654         socket,source,split,string,compare,first,index,last,length,match,%
6655         range,tolower,toupper,trim,trimleft,trimright,subst,switch,tell,%
6656         time,trace,variable,vdelete,vinfo,unknown,unset,uplevel,upvar,%
6657         vwait,while,acos,asin,atan,atan2,ceil,cos,cosh,exp,floor,fmod,%
6658         hypot,log,log10,pow,sin,sinh,sqrt,tan,tanh,abs,double,int,round%
6659         },%
6660     morestring=[d]",%
6661     morecomment=[f]\#,%
6662     morecomment=[l]{;\#},%
6663     morecomment=[l]{[\#},%
6664     morecomment=[l]{\{\#}%
6665   }[keywords,comments,strings]%
```

And after receiving a bug report from Vitaly A. Repin I converted the version 0.21
contents of `MoreSelectCharTable` to version 1.0.

```
6666 ⟨/lang2⟩
```

2.78 Statistical languages

These languages have been added by Winfried Theis. Robert Denham contributed
the additional string delimiter '.

```
6667 ⟨∗lang3⟩
```

```
6668 \lst@definelanguage{S}[]{R}{}
6669 \lst@definelanguage[PLUS]{S}[]{R}{}
6670 \lst@definelanguage{R}%
6671    {keywords={abbreviate,abline,abs,acos,acosh,action,add1,add,%
6672         aggregate,alias,Alias,alist,all,anova,any,aov,aperm,append,apply,%
6673         approx,approxfun,apropos,Arg,args,array,arrows,as,asin,asinh,%
6674         atan,atan2,atanh,attach,attr,attributes,autoload,autoloader,ave,%
6675         axis,backsolve,barplot,basename,besselI,besselJ,besselK,besselY,%
6676         beta,binomial,body,box,boxplot,break,browser,bug,builtins,bxp,by,%
6677         c,C,call,Call,case,cat,category,cbind,ceiling,character,char,%
6678         charmatch,check,chol,chol2inv,choose,chull,class,close,cm,codes,%
6679         coef,coefficients,co,col,colnames,colors,colours,commandArgs,%
6680         comment,complete,complex,conflicts,Conj,contents,contour,%
6681         contrasts,contr,control,helmert,contrib,convolve,cooks,coords,%
6682         distance,coplot,cor,cos,cosh,count,fields,cov,covratio,wt,CRAN,%
6683         create,crossprod,cummax,cummin,cumprod,cumsum,curve,cut,cycle,D,%
6684         data,dataentry,date,dbeta,dbinom,dcauchy,dchisq,de,debug,%
6685         debugger,Defunct,default,delay,delete,deltat,demo,de,density,%
6686         deparse,dependencies,Deprecated,deriv,description,detach,%
6687         dev2bitmap,dev,cur,deviance,off,prev,,dexp,df,dfbetas,dffits,%
6688         dgamma,dgeom,dget,dhyper,diag,diff,digamma,dim,dimnames,dir,%
6689         dirname,dlnorm,dlogis,dnbinom,dnchisq,dnorm,do,dotplot,double,%
6690         download,dpois,dput,drop,drop1,dsignrank,dt,dummy,dump,dunif,%
6691         duplicated,dweibull,dwilcox,dyn,edit,eff,effects,eigen,else,%
```

```
6692        emacs,end,environment,env,erase,eval,equal,evalq,example,exists,%
6693        exit,exp,expand,expression,External,extract,extractAIC,factor,%
6694        fail,family,fft,file,filled,find,fitted,fivenum,fix,floor,for,%
6695        For,formals,format,formatC,formula,Fortran,forwardsolve,frame,%
6696        frequency,ftable,ftable2table,function,gamma,Gamma,gammaCody,%
6697        gaussian,gc,gcinfo,gctorture,get,getenv,geterrmessage,getOption,%
6698        getwd,gl,glm,globalenv,gnome,GNOME,graphics,gray,grep,grey,grid,%
6699        gsub,hasTsp,hat,heat,help,hist,home,hsv,httpclient,I,identify,if,%
6700        ifelse,Im,image,\%in\%,index,influence,measures,inherits,install,%
6701        installed,integer,interaction,interactive,Internal,intersect,%
6702        inverse,invisible,IQR,is,jitter,kappa,kronecker,labels,lapply,%
6703        layout,lbeta,lchoose,lcm,legend,length,levels,lgamma,library,%
6704        licence,license,lines,list,lm,load,local,locator,log,log10,log1p,%
6705        log2,logical,loglin,lower,lowess,ls,lsfit,lsf,ls,machine,Machine,%
6706        mad,mahalanobis,make,link,margin,match,Math,matlines,mat,matplot,%
6707        matpoints,matrix,max,mean,median,memory,menu,merge,methods,min,%
6708        missing,Mod,mode,model,response,mosaicplot,mtext,mvfft,na,nan,%
6709        names,omit,nargs,nchar,ncol,NCOL,new,next,NextMethod,nextn,%
6710        nlevels,nlm,noquote,NotYetImplemented,NotYetUsed,nrow,NROW,null,%
6711        numeric,\%o\%,objects,offset,old,on,Ops,optim,optimise,optimize,%
6712        options,or,order,ordered,outer,package,packages,page,pairlist,%
6713        pairs,palette,panel,par,parent,parse,paste,path,pbeta,pbinom,%
6714        pcauchy,pchisq,pentagamma,persp,pexp,pf,pgamma,pgeom,phyper,pico,%
6715        pictex,piechart,Platform,plnorm,plogis,plot,pmatch,pmax,pmin,%
6716        pnbinom,pnchisq,pnorm,points,poisson,poly,polygon,polyroot,pos,%
6717        postscript,power,ppoints,ppois,predict,preplot,pretty,Primitive,%
6718        print,prmatrix,proc,prod,profile,proj,prompt,prop,provide,%
6719        psignrank,ps,pt,ptukey,punif,pweibull,pwilcox,q,qbeta,qbinom,%
6720        qcauchy,qchisq,qexp,qf,qgamma,qgeom,qhyper,qlnorm,qlogis,qnbinom,%
6721        qnchisq,qnorm,qpois,qqline,qqnorm,qqplot,qr,Q,qty,qy,qsignrank,%
6722        qt,qtukey,quantile,quasi,quit,qunif,quote,qweibull,qwilcox,%
6723        rainbow,range,rank,rbeta,rbind,rbinom,rcauchy,rchisq,Re,read,csv,%
6724        csv2,fwf,readline,socket,real,Recall,rect,reformulate,regexpr,%
6725        relevel,remove,rep,repeat,replace,replications,report,require,%
6726        resid,residuals,restart,return,rev,rexp,rf,rgamma,rgb,rgeom,R,%
6727        rhyper,rle,rlnorm,rlogis,rm,rnbinom,RNGkind,rnorm,round,row,%
6728        rownames,rowsum,rpois,rsignrank,rstandard,rstudent,rt,rug,runif,%
6729        rweibull,rwilcox,sample,sapply,save,scale,scan,scan,screen,sd,se,%
6730        search,searchpaths,segments,seq,sequence,setdiff,setequal,set,%
6731        setwd,show,sign,signif,sin,single,sinh,sink,solve,sort,source,%
6732        spline,splinefun,split,sqrt,stars,start,stat,stem,step,stop,%
6733        storage,strstrheight,stripplot,strsplit,structure,strwidth,sub,%
6734        subset,substitute,substr,substring,sum,summary,sunflowerplot,svd,%
6735        sweep,switch,symbol,symbols,symnum,sys,status,system,t,table,%
6736        tabulate,tan,tanh,tapply,tempfile,terms,terrain,tetragamma,text,%
6737        time,title,topo,trace,traceback,transform,tri,trigamma,trunc,try,%
6738        ts,tsp,typeof,unclass,undebug,undoc,union,unique,uniroot,unix,%
6739        unlink,unlist,unname,untrace,update,upper,url,UseMethod,var,%
6740        variable,vector,Version,vi,warning,warnings,weighted,weights,%
6741        which,while,window,write,\%x\%,x11,X11,xedit,xemacs,xinch,xor,%
6742        xpdrows,xy,xyinch,yinch,zapsmall,zip},%
6743    otherkeywords={!,!=,~,$,*,\&,\%/\%,\%*\%,\%\%,<-,<<-,_,/},%
6744    alsoother={._$},%
6745    sensitive,%
```

```
6746    morecomment=[l]\#,%
6747    morestring=[d]",%
6748    morestring=[d]'% 2001 Robert Denham
6749    }%
```

Benjamin Janson got a `prockeywords undefined` error, which was removed by Heiko Oberdiek.

```
6750 \lst@definelanguage{SAS}{%
6751   procnamekeys={proc},%
6752   morekeywords={DATA, AND, OR, NOT, EQ, GT, LT, GE, LE, NE, INFILE, INPUT,%
6753      DO, BY, TO, SIN, COS, OUTPUT, END, PLOT, RUN, LIBNAME, VAR, TITLE,%
6754      FIRSTOBS, OBS, DELIMITER, DLM, EOF, ABS, DIM, HBOUND, LBOUND, MAX, MIN,%
6755      MOD, SIGN, SQRT, CEIL, FLOOR, FUZZ, INT, ROUND, TRUNC, DIGAMMA, ERF,%
6756      ERFC, EXP, GAMMA, LGAMMA, LOG, LOG2, LOG10, ARCOS, ARSIN, ATAN, COSH,%
6757      SINH, TANH, TAN, POISSON, PROBBETA, PROBBNML, PROBCHI, PROBF, PROBGAM,%
6758      PROBHYPR, PROBNEGB, PROBNORM, PROBT, BETAINV, CINV, FINV, GAMINV,%
6759      PROBIT, TINV, CSS, CV, KURTOSIS, MEAN, NMISS, RANGE, SKEWNESS, STD,%
6760      STDERR, SUM, USS, NORMAL, RANBIN, RANCAU, RANEXP, RANGAM, RANNOR,%
6761      RANPOI, RANTBL, RANTRI, RANUNI, UNIFORM, IF, THEN, ELSE, WHILE, UNTIL,%
6762      DROP, KEEP, LABEL, DEFAULT, ARRAY, MERGE, CARDS, CARDS4, PUT, SET,%
6763      UPDATE, ABORT, DELETE, DISPLAY, LIST, LOSTCARD, MISSING, STOP, WHERE,%
6764      ARRAY, DROP, KEEP, WINDOW, LENGTH, RENAME, RETAIN, MEANS, UNIVARIATE,%
6765      SUMMARY, TABULATE, CORR, FREQ, FOOTNOTE, NOTE, SHOW},%
6766   otherkeywords={!,!=,~,$,*,\&,_,/,<,>=,=<,>},%
6767   morestring=[d]'%
6768 }[keywords,comments,strings,procnames]%

6769 ⟨/lang3⟩
```

2.79 TEX

I extracted the data from `plain.tex`, `latex.ltx`, and `size10.clo`. Dr. Peter Leibner reported that some keywords are missing and also added a couple.

```
6770 ⟨*lang3⟩

6771 \lst@definelanguage[AlLaTeX]{TeX}[LaTeX]{TeX}%
6772   {moretexcs={AtBeginDocument,AtBeginDvi,AtEndDocument,AtEndOfClass,%
6773      AtEndOfPackage,ClassError,ClassInfo,ClassWarning,%
6774      ClassWarningNoLine,CurrentOption,DeclareErrorFont,%
6775      DeclareFixedFont,DeclareFontEncoding,DeclareFontEncodingDefaults,%
6776      DeclareFontFamily,DeclareFontShape,DeclareFontSubstitution,%
6777      DeclareMathAccent,DeclareMathAlphabet,DeclareMathAlphabet,%
6778      DeclareMathDelimiter,DeclareMathRadical,DeclareMathSizes,%
6779      DeclareMathSymbol,DeclareMathVersion,DeclareOldFontCommand,%
6780      DeclareOption,DeclarePreloadSizes,DeclareRobustCommand,%
6781      DeclareSizeFunction,DeclareSymbolFont,DeclareSymbolFontAlphabet,%
6782      DeclareTextAccent,DeclareTextAccentDefault,DeclareTextCommand,%
6783      DeclareTextCommandDefault,DeclareTextComposite,%
6784      DeclareTextCompositeCommand,DeclareTextFontCommand,%
6785      DeclareTextSymbol,DeclareTextSymbolDefault,ExecuteOptions,%
6786      GenericError,GenericInfo,GenericWarning,IfFileExists,%
6787      InputIfFileExists,LoadClass,LoadClassWithOptions,MessageBreak,%
6788      OptionNotUsed,PackageError,PackageInfo,PackageWarning,%
6789      PackageWarningNoLine,PassOptionsToClass,PassOptionsToPackage,%
6790      ProcessOptionsProvidesClass,ProvidesFile,ProvidesFile,%
```

```
6791        ProvidesPackage,ProvideTextCommand,RequirePackage,%
6792        RequirePackageWithOptions,SetMathAlphabet,SetSymbolFont,%
6793        TextSymbolUnavailable,UseTextAccent,UseTextSymbol},%
6794      morekeywords={array,center,displaymath,document,enumerate,eqnarray,%
6795        equation,flushleft,flushright,itemize,list,lrbox,math,minipage,%
6796        picture,sloppypar,tabbing,tabular,trivlist,verbatim}%
6797    }%
6798  \lst@definelanguage[LaTeX]{TeX}[common]{TeX}%
6799    {moretexcs={a,AA,aa,addcontentsline,addpenalty,addtocontents,%
6800        addtocounter,addtolength,addtoversion,addvspace,alph,Alph,and,%
6801        arabic,array,arraycolsep,arrayrulewidth,arraystretch,author,%
6802        baselinestretch,begin,bezier,bfseries,bibcite,bibdata,bibitem,%
6803        bibliography,bibliographystyle,bibstyle,bigskip,boldmath,%
6804        botfigrule,bottomfraction,Box,caption,center,CheckCommand,circle,%
6805        citation,cite,cleardoublepage,clearpage,cline,columnsep,%
6806        columnseprule,columnwidth,contentsline,dashbox,date,dblfigrule,%
6807        dblfloatpagefraction,dblfloatsep,dbltextfloatsep,dbltopfraction,%
6808        defaultscriptratio,defaultscriptscriptratio,depth,Diamond,%
6809        displaymath,document,documentclass,documentstyle,doublerulesep,%
6810        em,emph,endarray,endcenter,enddisplaymath,enddocument,%
6811        endenumerate,endeqnarray,endequation,endflushleft,endflushright,%
6812        enditemize,endlist,endlrbox,endmath,endminipage,endpicture,%
6813        endsloppypar,endtabbing,endtabular,endtrivlist,endverbatim,%
6814        enlargethispage,ensuremath,enumerate,eqnarray,equation,%
6815        evensidemargin,extracolsep,fbox,fboxrule,fboxsep,filecontents,%
6816        fill,floatpagefraction,floatsep,flushbottom,flushleft,flushright,%
6817        fnsymbol,fontencoding,fontfamily,fontseries,fontshape,fontsize,%
6818        fontsubfuzz,footnotemark,footnotesep,footnotetext,footskip,frac,%
6819        frame,framebox,fussy,glossary,headheight,headsep,height,hline,%
6820        hspace,I,include,includeonly,index,inputlineno,intextsep,%
6821        itemindent,itemize,itemsep,iterate,itshape,Join,kill,label,%
6822        labelsep,labelwidth,LaTeX,LaTeXe,leadsto,lefteqn,leftmargin,%
6823        leftmargini,leftmarginii,leftmarginiii,leftmarginiv,leftmarginv,%
6824        leftmarginvi,leftmark,lhd,lim,linebreak,linespread,linethickness,%
6825        linewidth,list,listfiles,listfiles,listparindent,lrbox,%
6826        makeatletter,makeatother,makebox,makeglossary,makeindex,%
6827        makelabel,MakeLowercase,MakeUppercase,marginpar,marginparpush,%
6828        marginparsep,marginparwidth,markboth,markright,math,mathbf,%
6829        mathellipsis,mathgroup,mathit,mathrm,mathsf,mathsterling,mathtt,%
6830        mathunderscore,mathversion,mbox,mdseries,mho,minipage,%
6831        multicolumn,multiput,NeedsTeXFormat,newcommand,newcounter,%
6832        newenvironment,newfont,newhelp,newlabel,newlength,newline,%
6833        newmathalphabet,newpage,newsavebox,newtheorem,nobreakspace,%
6834        nobreakspace,nocite,nocorr,nocorrlist,nofiles,nolinebreak,%
6835        nonumber,nopagebreak,normalcolor,normalfont,normalmarginpar,%
6836        numberline,obeycr,oddsidemargin,oldstylenums,onecolumn,oval,%
6837        pagebreak,pagenumbering,pageref,pagestyle,paperheight,paperwidth,%
6838        paragraphmark,parbox,parsep,partopsep,picture,poptabs,pounds,%
6839        protect,pushtabs,put,qbezier,qbeziermax,r,raggedleft,raisebox,%
6840        ref,refstepcounter,renewcommand,renewenvironment,restorecr,%
6841        reversemarginpar,rhd,rightmargin,rightmark,rmfamily,roman,Roman,%
6842        rootbox,rule,samepage,sbox,scshape,secdef,section,sectionmark,%
6843        selectfont,setcounter,settodepth,settoheight,settowidth,sffamily,%
6844        shortstack,showoutput,showoverfull,sloppy,sloppypar,slshape,%
```

```
6845        smallskip,sqsubset,sqsupset,SS,stackrel,stepcounter,stop,stretch,%
6846        subparagraphmark,subsectionmark,subsubsectionmark,sum,%
6847        suppressfloats,symbol,tabbing,tabbingsep,tabcolsep,tabular,%
6848        tabularnewline,textasciicircum,textasciitilde,textbackslash,%
6849        textbar,textbf,textbraceleft,textbraceright,textbullet,%
6850        textcircled,textcompwordmark,textdagger,textdaggerdbl,textdollar,%
6851        textellipsis,textemdash,textendash,textexclamdown,textfloatsep,%
6852        textfraction,textgreater,textheight,textit,textless,textmd,%
6853        textnormal,textparagraph,textperiodcentered,textquestiondown,%
6854        textquotedblleft,textquotedblright,textquoteleft,textquoteright,%
6855        textregistered,textrm,textsc,textsection,textsf,textsl,%
6856        textsterling,textsuperscript,texttrademark,texttt,textunderscore,%
6857        textup,textvisiblespace,textwidth,thanks,thefootnote,thempfn,%
6858        thempfn,thempfootnote,thepage,thepage,thicklines,thinlines,%
6859        thispagestyle,title,today,topfigrule,topfraction,topmargin,%
6860        topsep,totalheight,tracingfonts,trivlist,ttfamily,twocolumn,%
6861        typein,typeout,unboldmath,unitlength,unlhd,unrhd,upshape,usebox,%
6862        usecounter,usefont,usepackage,value,vector,verb,verbatim,vline,%
6863        vspace,width,%
6864        normalsize,small,footnotesize,scriptsize,tiny,large,Large,LARGE,%
6865        huge,Huge}%
6866    }%
6867 \lst@definelanguage[plain]{TeX}[common]{TeX}%
6868    {moretexcs={advancepageno,beginsection,bf,bffam,bye,cal,cleartabs,%
6869        columns,dosupereject,endinsert,eqalign,eqalignno,fiverm,fivebf,%
6870        fivei,fivesy,folio,footline,hang,headline,it,itemitem,itfam,%
6871        leqalignno,magnification,makefootline,makeheadline,midinsert,mit,%
6872        mscount,nopagenumbers,normalbottom,of,oldstyle,pagebody,%
6873        pagecontents,pageinsert,pageno,plainoutput,preloaded,proclaim,rm,%
6874        settabs,sevenbf,seveni,sevensy,sevenrm,sl,slfam,supereject,%
6875        tabalign,tabs,tabsdone,tabsyet,tenbf,tenex,teni,tenit,tenrm,%
6876        tensl,tensy,tentt,textindent,topglue,topins,topinsert,tt,ttfam,%
6877        ttraggedright,vfootnote}%
6878    }%
```

The following language is only a helper.

```
6879 \lst@definelanguage[common]{TeX}[primitive]{TeX}
6880    {moretexcs={active,acute,ae,AE,aleph,allocationnumber,allowbreak,%
6881        alpha,amalg,angle,approx,arccos,arcsin,arctan,arg,arrowvert,%
6882        Arrowvert,ast,asymp,b,backslash,bar,beta,bgroup,big,Big,bigbreak,%
6883        bigcap,bigcirc,bigcup,bigg,Bigg,biggl,Biggl,biggm,Biggm,biggr,%
6884        Biggr,bigl,Bigl,bigm,Bigm,bigodot,bigoplus,bigotimes,bigr,Bigr,%
6885        bigskip,bigskipamount,bigsqcup,bigtriangledown,bigtriangleup,%
6886        biguplus,bigvee,bigwedge,bmod,bordermatrix,bot,bowtie,brace,%
6887        braceld,bracelu,bracerd,braceru,bracevert,brack,break,breve,%
6888        buildrel,bullet,c,cap,cases,cdot,cdotp,cdots,centering,%
6889        centerline,check,chi,choose,circ,clubsuit,colon,cong,coprod,%
6890        copyright,cos,cosh,cot,coth,csc,cup,d,dag,dagger,dashv,ddag,%
6891        ddagger,ddot,ddots,deg,delta,Delta,det,diamond,diamondsuit,dim,%
6892        displaylines,div,do,dospecials,dot,doteq,dotfill,dots,downarrow,%
6893        Downarrow,downbracefill,egroup,eject,ell,empty,emptyset,endgraf,%
6894        endline,enskip,enspace,epsilon,equiv,eta,exists,exp,filbreak,%
6895        flat,fmtname,fmtversion,footins,footnote,footnoterule,forall,%
6896        frenchspacing,frown,gamma,Gamma,gcd,ge,geq,gets,gg,goodbreak,%
```

```
6897        grave,H,hat,hbar,heartsuit,hglue,hideskip,hidewidth,hom,%
6898        hookleftarrow,hookrightarrow,hphantom,hrulefill,i,ialign,iff,Im,%
6899        imath,in,inf,infty,int,interdisplaylinepenalty,%
6900        interfootnotelinepenalty,intop,iota,item,j,jmath,joinrel,jot,%
6901        kappa,ker,l,L,lambda,Lambda,land,langle,lbrace,lbrack,lceil,%
6902        ldotp,ldots,le,leavevmode,leftarrow,Leftarrow,leftarrowfill,%
6903        leftharpoondown,leftharpoonup,leftline,leftrightarrow,%
6904        Leftrightarrow,leq,lfloor,lg,lgroup,lhook,lim,liminf,limsup,line,%
6905        ll,llap,lmoustache,ln,lnot,log,longleftarrow,Longleftarrow,%
6906        longleftrightarrow,Longleftrightarrow,longmapsto,longrightarrow,%
6907        Longrightarrow,loop,lor,lq,magstep,magstep,magstephalf,mapsto,%
6908        mapstochar,mathhexbox,mathpalette,mathstrut,matrix,max,maxdimen,%
6909        medbreak,medskip,medskipamount,mid,min,models,mp,mu,multispan,%
6910        nabla,narrower,natural,ne,nearrow,neg,negthinspace,neq,newbox,%
6911        newcount,newdimen,newfam,newif,newinsert,newlanguage,newmuskip,%
6912        newread,newskip,newtoks,newwrite,next,ni,nobreak,nointerlineskip,%
6913        nonfrenchspacing,normalbaselines,normalbaselineskip,%
6914        normallineskip,normallineskiplimit,not,notin,nu,null,nwarrow,o,O,%
6915        oalign,obeylines,obeyspaces,odot,oe,OE,offinterlineskip,oint,%
6916        ointop,omega,Omega,ominus,ooalign,openup,oplus,oslash,otimes,%
6917        overbrace,overleftarrow,overrightarrow,owns,P,parallel,partial,%
6918        perp,phantom,phi,Phi,pi,Pi,pm,pmatrix,pmod,Pr,prec,preceq,prime,%
6919        prod,propto,psi,Psi,qquad,quad,raggedbottom,raggedright,rangle,%
6920        rbrace,rbrack,rceil,Re,relbar,Relbar,removelastskip,repeat,%
6921        rfloor,rgroup,rho,rhook,rightarrow,Rightarrow,rightarrowfill,%
6922        rightharpoondown,rightharpoonup,rightleftharpoons,rightline,rlap,%
6923        rmoustache,root,rq,S,sb,searrow,sec,setminus,sharp,showhyphens,%
6924        sigma,Sigma,sim,simeq,sin,sinh,skew,slash,smallbreak,smallint,%
6925        smallskip,smallskipamount,smash,smile,sp,space,spadesuit,sqcap,%
6926        sqcup,sqrt,sqsubseteq,sqsupseteq,ss,star,strut,strutbox,subset,%
6927        subseteq,succ,succeq,sum,sup,supset,supseteq,surd,swarrow,t,tan,%
6928        tanh,tau,TeX,theta,Theta,thinspace,tilde,times,to,top,tracingall,%
6929        triangle,triangleleft,triangleright,u,underbar,underbrace,%
6930        uparrow,Uparrow,upbracefill,updownarrow,Updownarrow,uplus,%
6931        upsilon,Upsilon,v,varepsilon,varphi,varpi,varrho,varsigma,%
6932        vartheta,vdash,vdots,vec,vee,vert,Vert,vglue,vphantom,wedge,%
6933        widehat,widetilde,wlog,wp,wr,xi,Xi,zeta}%
6934    }%
```

Herbert Voss pointed to a typo: the TEX primitive is `lineskiplimit` instead of `lineskiplimits`.

```
6935 \lst@definelanguage[primitive]{TeX}%
6936    {moretexcs={above,abovedisplayshortskip,abovedisplayskip,aftergroup,%
6937        abovewithdelims,accent,adjdemerits,advance,afterassignment,atop,%
6938        atopwithdelims,badness,baselineskip,batchmode,begingroup,%
6939        belowdisplayshortskip,belowdisplayskip,binoppenalty,botmark,box,%
6940        boxmaxdepth,brokenpenalty,catcode,char,chardef,cleaders,closein,%
6941        closeout,clubpenalty,copy,count,countdef,cr,crcr,csname,day,%
6942        deadcycles,def,defaulthyphenchar,defaultskewchar,delcode,%
6943        delimiter,delimiterfactor,delimitershortfall,dimen,dimendef,%
6944        discretionary,displayindent,displaylimits,displaystyle,%
6945        displaywidowpenalty,displaywidth,divide,doublehyphendemerits,dp,%
6946        edef,else,emergencystretch,end,endcsname,endgroup,endinput,%
6947        endlinechar,eqno,errhelp,errmessage,errorcontextlines,%
```

```
6948        errorstopmode,escapechar,everycr,everydisplay,everyhbox,everyjob,%
6949        everymath,everypar,everyvbox,exhyphenpenalty,expandafter,fam,fi,%
6950        finalhypendemerits,firstmark,floatingpenalty,font,fontdimen,%
6951        fontname,futurelet,gdef,global,globaldefs,halign,hangafter,%
6952        hangindent,hbadness,hbox,hfil,hfill,hfilneg,hfuzz,hoffset,%
6953        holdinginserts,hrule,hsize,hskip,hss,ht,hyphenation,hyphenchar,%
6954        hyphenpenalty,if,ifcase,ifcat,ifdim,ifeof,iffalse,ifhbox,ifhmode,%
6955        ifinner,ifmmode,ifnum,ifodd,iftrue,ifvbox,ifvmode,ifvoid,ifx,%
6956        ignorespaces,immediate,indent,input,insert,insertpenalties,%
6957        interlinepenalty,jobname,kern,language,lastbox,lastkern,%
6958        lastpenalty,lastskip,lccode,leaders,left,lefthyphenmin,leftskip,%
6959        leqno,let,limits,linepenalty,lineskip,lineskiplimit,long,%
6960        looseness,lower,lowercase,mag,mark,mathaccent,mathbin,mathchar,%
6961        mathchardef,mathchoice,mathclose,mathcode,mathinner,mathop,%
6962        mathopen,mathord,mathpunct,mathrel,mathsurround,maxdeadcycles,%
6963        maxdepth,meaning,medmuskip,message,mkern,month,moveleft,%
6964        moveright,mskip,multiply,muskip,muskipdef,newlinechar,noalign,%
6965        noboundary,noexpand,noindent,nolimits,nonscript,nonstopmode,%
6966        nulldelimiterspace,nullfont,number,omit,openin,openout,or,outer,%
6967        output,outputpenalty,over,overfullrule,overline,overwithdelims,%
6968        pagedepth,pagefilllstretch,pagefillstretch,pagefilstretch,%
6969        pagegoal,pageshrink,pagestretch,pagetotal,par,parfillskip,%
6970        parindent,parshape,parskip,patterns,pausing,penalty,%
6971        postdisplaypenalty,predisplaypenalty,predisplaysize,pretolerance,%
6972        prevdepth,prevgraf,radical,raise,read,relax,relpenalty,right,%
6973        righthyphenmin,rightskip,romannumeral,scriptfont,%
6974        scriptscriptfont,scriptscriptstyle,scriptspace,scriptstyle,%
6975        scrollmode,setbox,setlanguage,sfcode,shipout,show,showbox,%
6976        showboxbreadth,showboxdepth,showlists,showthe,skewchar,skip,%
6977        skipdef,spacefactor,spaceskip,span,special,splitbotmark,%
6978        splitfirstmark,splitmaxdepth,splittopskip,string,tabskip,%
6979        textfont,textstyle,the,thickmuskip,thinmuskip,time,toks,toksdef,%
6980        tolerance,topmark,topskip,tracingcommands,tracinglostchars,%
6981        tracingmacros,tracingonline,tracingoutput,tracingpages,%
6982        tracingparagraphs,tracingrestores,tracingstats,uccode,uchyph,%
6983        underline,unhbox,unhcopy,unkern,unpenalty,unskip,unvbox,unvcopy,%
6984        uppercase,vadjust,valign,vbadness,vbox,vcenter,vfil,vfill,%
6985        vfilneg,vfuzz,voffset,vrule,vsize,vskip,vsplit,vss,vtop,wd,%
6986        widowpenalty,write,xdef,xleaders,xspaceskip,year},%
6987    sensitive,%
6988    alsoother={0123456789$_},%$ to make Emacs fontlocking happy
6989    morecomment=[l]\%%
6990  }[keywords,tex,comments]%

6991 ⟨/lang3⟩
```

2.80   VBScript

Sonja WeidmannVBScript sent me this language definition.

```
6992 ⟨∗lang2⟩

6993 %%
6994 %% VBScript definition (c) 2000 Sonja Weidmann
6995 %%
6996 \lst@definelanguage{VBScript}%
```

```
6997  {morekeywords={Call,Case,Const,Dim,Do,Each,Else,End,Erase,Error,Exit,%
6998      Explicit,For,Function,If,Loop,Next,On,Option,Private,Public,%
6999      Randomize,ReDim,Rem,Select,Set,Sub,Then,Wend,While,Abs,Array,Asc,%
7000      Atn,CBool,CByte,CCur,CDate,CDbl,Chr,CInt,CLng,Cos,CreateObject,%
7001      CSng,CStr,Date,DateAdd,DateDiff,DatePart,DateSerial,DateValue,%
7002      Day,Exp,Filter,Fix,FormatCurrency,FormatDateTime,FormatNumber,%
7003      FormatPercent,GetObject,Hex,Hour,InputBox,InStr,InStrRev,Int,%
7004      IsArray,IsDate,IsEmpty,IsNull,IsNumeric,IsObject,Join,LBound,%
7005      LCase,Left,Len,LoadPicture,Log,LTrim,Mid,Minute,Month,MonthName,%
7006      MsgBox,Now,Oct,Replace,RGB,Right,Rnd,Round,RTrim,ScriptEngine,%
7007      ScriptEngineBuildVersion,ScriptEngineMajorVersion,%
7008      ScriptEngineMinorVersion,Second,Sgn,Sin,Space,Split,Sqr,StrComp,%
7009      StrReverse,String,Tan,Time,TimeSerial,TimeValue,Trim,TypeName,%
7010      UBound,UCase,VarType,Weekday,WeekdayName,Year, And,Eqv,Imp,Is,%
7011      Mod,Not,Or,Xor,Add,BuildPath,Clear,Close,Copy,CopyFile,%
7012      CopyFolder,CreateFolder,CreateTextFile,Delete,DeleteFile,%
7013      DeleteFolder,Dictionary,Drive,DriveExists,Drives,Err,Exists,File,%
7014      FileExists,FileSystemObject,Files,Folder,FolderExists,Folders,%
7015      GetAbsolutePathName,GetBaseName,GetDrive,GetDriveName,%
7016      GetExtensionName,GetFile,GetFileName,GetFolder,%
7017      GetParentFolderName,GetSpecialFolder,GetTempName,Items,Keys,Move,%
7018      MoveFile,MoveFolder,OpenAsTextStream,OpenTextFile,Raise,Read,%
7019      ReadAll,ReadLine,Remove,RemoveAll,Skip,SkipLine,TextStream,Write,%
7020      WriteBlankLines,WriteLine,Alias,Archive,CDROM,Compressed,%
7021      Directory,Fixed,ForAppending,ForReading,ForWriting,Hidden,Normal,%
7022      RAMDisk,ReadOnly,Remote,Removable,System,SystemFolder,%
7023      TemporaryFolder,TristateFalse,TristateTrue,TristateUseDefault,%
7024      Unknown,Volume,WindowsFolder,vbAbortRetryIgnore,%
7025      vbApplicationModal,vbArray,vbBinaryCompare,vbBlack,vbBlue,%
7026      vbBoolean,vbByte,vbCr,vbCrLf,vbCritical,vbCurrency,vbCyan,%
7027      vbDataObject,vbDate,vbDecimal,vbDefaultButton1,vbDefaultButton2,%
7028      vbDefaultButton3,vbDefaultButton4,vbDouble,vbEmpty,vbError,%
7029      vbExclamation,vbFirstFourDays,vbFirstFullWeek,vbFirstJan1,%
7030      vbFormFeed,vbFriday,vbGeneralDate,vbGreen,vbInformation,%
7031      vbInteger,vbLf,vbLong,vbLongDate,vbLongTime,vbMagenta,vbMonday,%
7032      vbNewLine,vbNull,vbNullChar,vbNullString,vbOKC,ancel,vbOKOnly,%
7033      vbObject,vbObjectError,vbQuestion,vbRed,vbRetryCancel,vbSaturday,%
7034      vbShortDate,vbShortTime,vbSingle,vbString,vbSunday,vbSystemModal,%
7035      vbTab,vbTextCompare,vbThursday,vbTuesday,vbUseSystem,%
7036      vbUseSystemDayOfWeek,vbVariant,vbVerticalTab,vbWednesday,vbWhite,%
7037      vbYellow,vbYesNo,vbYesNoCancel},%
7038    sensitive=f,%
7039    morecomment=[l]',%
7040    morestring=[d]"%
7041  }[keywords,comments,strings]%
```

7042 ⟨/lang2⟩

2.81   Verilog

Thanks to Cameron H. G. Wright for providing the definition. After a bug report by George M. Georgiou I changed the declaration of directives to use normal keywords.

7043 ⟨*lang3⟩

```
7044 %%
7045 %% Verilog definition (c) 2003 Cameron H. G. Wright <c.h.g.wright@ieee.org>
7046 %% Based on the IEEE 1364-2001 Verilog HDL standard
7047 %% Ref: S. Palnitkar, "Verilog HDL: A Guide to Digital Design and Synthesis,"
7048 %%      Prentice Hall, 2003. ISBN: 0-13-044911-3
7049 %%
7050 \lst@definelanguage{Verilog}%
7051   {morekeywords={% reserved keywords
7052       always,and,assign,automatic,begin,buf,bufif0,bufif1,case,casex,%
7053       casez,cell,cmos,config,deassign,default,defparam,design,disable,%
7054       edge,else,end,endcase,endconfig,endfunction,endgenerate,%
7055       endmodule,endprimitive,endspecify,endtable,endtask,event,for,%
7056       force,forever,fork,function,generate,genvar,highz0,highz1,if,%
7057       ifnone,incdir,include,initial,inout,input,instance,integer,join,%
7058       large,liblist,library,localparam,macromodule,medium,module,nand,%
7059       negedge,nmos,nor,noshowcancelled,not,notif0,notif1,or,output,%
7060       parameter,pmos,posedge,primitive,pull0,pull1,pulldown,pullup,%
7061       pulsestyle_onevent,pulsestyle_ondetect,rcmos,real,realtime,reg,%
7062       release,repeat,rnmos,rpmos,rtran,rtranif0,rtranif1,scalared,%
7063       showcancelled,signed,small,specify,specparam,strong0,strong1,%
7064       supply0,supply1,table,task,time,tran,tranif0,tranif1,tri,tri0,%
7065       tri1,triand,trior,trireg,unsigned,use,vectored,wait,wand,weak0,%
7066       weak1,while,wire,wor,xnor,xor},%
7067   morekeywords=[2]{% system tasks and functions
7068       $bitstoreal,$countdrivers,$display,$fclose,$fdisplay,$fmonitor,%
7069       $fopen,$fstrobe,$fwrite,$finish,$getpattern,$history,$incsave,%
7070       $input,$itor,$key,$list,$log,$monitor,$monitoroff,$monitoron,%
7071       $nokey},%
7072   morekeywords=[3]{% compiler directives
7073       `accelerate,`autoexpand_vectornets,`celldefine,`default_nettype,%
7074       `define,`else,`elsif,`endcelldefine,`endif,`endprotect,%
7075       `endprotected,`expand_vectornets,`ifdef,`ifndef,`include,%
7076       `no_accelerate,`noexpand_vectornets,`noremove_gatenames,%
7077       `nounconnected_drive,`protect,`protected,`remove_gatenames,%
7078       `remove_netnames,`resetall,`timescale,`unconnected_drive},%
7079   alsoletter=\`,%
7080   sensitive,%
7081   morecomment=[s]{/*}{*/},%
7082   morecomment=[l]//,% nonstandard
7083   morestring=[b]"%
7084   }[keywords,comments,strings]%
7085 ⟨/lang3⟩
```

2.82 VHDL

This language is due to Kai WollenweberVHDL. I've done conversion to version
0.19 only. Gaurav Aggarwal reported that VHDL is case insensitive and Ar-
naud Tisseranddded three keywords.

```
7086 ⟨*lang1⟩
7087 %%
7088 %% VHDL definition (c) 1997 Kai Wollenweber
7089 %%
7090 \lst@definelanguage{VHDL}%
```

```
7091  {morekeywords={ALL,ARCHITECTURE,ABS,AND,ASSERT,ARRAY,AFTER,ALIAS,%
7092      ACCESS,ATTRIBUTE,BEGIN,BODY,BUS,BLOCK,BUFFER,CONSTANT,CASE,%
7093      COMPONENT,CONFIGURATION,DOWNTO,ELSE,ELSIF,END,ENTITY,EXIT,%
7094      FUNCTION,FOR,FILE,GENERIC,GENERATE,GUARDED,GROUP,IF,IN,INOUT,IS,%
7095      INERTIAL,IMPURE,LIBRARY,LOOP,LABEL,LITERAL,LINKAGE,MAP,MOD,NOT,%
7096      NOR,NAND,NULL,NEXT,NEW,OUT,OF,OR,OTHERS,ON,OPEN,PROCESS,PORT,%
7097      PACKAGE,PURE,PROCEDURE,POSTPONED,RANGE,REM,ROL,ROR,REPORT,RECORD,%
7098      RETURN,REGISTER,REJECT,SIGNAL,SUBTYPE,SLL,SRL,SLA,SRA,SEVERITY,%
7099      SELECT,THEN,TYPE,TRANSPORT,TO,USE,UNITS,UNTIL,VARIABLE,WHEN,WAIT,%
7100      WHILE,XOR,XNOR,%
7101      DISCONNECT,ELIF,WITH},% Arnaud Tisserand
7102   sensitive=f,% 1998 Gaurav Aggarwal
7103   morecomment=[l]--,%
7104   morestring=[d]{"}%
7105   }[keywords,comments,strings]%
```

The VHDL-AMS dialect has been added by Steffen Klupsch.

```
7106 %%
7107 %% VHDL-AMS definition (c) Steffen Klupsch
7108 %%
7109 \lst@definelanguage[AMS]{VHDL}[]{VHDL}%
7110   {morekeywords={ACROSS,ARRAY,BREAK,DISCONNECT,NATURE,NOISE,PORT,%
7111      PROCEDURAL,QUANTITY,SHARED,SPECTRUM,SUBNATURE,TERMINAL,THROUGH,%
7112      TOLERANCE,UNAFFACTED,UNITS}}
```

```
7113 ⟨/lang1⟩
```

2.83 VRML

This language is due to Oliver BaumVRML.

```
7114 ⟨*lang2⟩
```

```
7115 %%
7116 %% VRML definition (c) 2001 Oliver Baum
7117 %%
7118 \lst@definelanguage[97]{VRML}{%
7119   morekeywords={DEF, EXTERNPROTO, FALSE, IS, NULL, PROTO, ROUTE, TO, TRUE,%
7120     USE, eventIn, eventOut, exposedField, field, Introduction, Anchor,%
7121     Appearance, AudioClip, Background, Billboard, Box, Collision, Color,%
7122     ColorInterpolator, Cone, Coordinate, CoordinateInterpolator, Cylinder,%
7123     CylinderSensor, DirectionalLight, ElevationGrid, Extrusion, Fog,%
7124     FontStyle, Group, ImageTexture, IndexedFaceSet, IndexedLineSet, Inline,%
7125     LOD, Material, MovieTexture, NavigationInfo, Normal,%
7126     NormalInterpolator, OrientationInterpolator, PixelTexture, PlaneSensor,%
7127     PointLight, PointSet, PositionInterpolator, ProximitySensor,%
7128     ScalarInterpolator, Script, Shape, Sound, Sphere, SphereSensor,%
7129     SpotLight, Switch, Text, TextureCoordinate, TextureTransform,%
7130     TimeSensor, TouchSensor, Transform, Viewpoint, VisibilitySensor,%
7131     WorldInfo},%
7132   morecomment=[l]\#,% bug: starts comment in the first column
7133   morestring=[b]"%
7134 }[keywords,comments,strings]
```

```
7135 ⟨/lang2⟩
```

2.84 XML et al

Bernhard Walle provided the following two definitions.

```
7136 ⟨∗lang1⟩
7137 \lst@definelanguage{XSLT}[]{XML}%
7138   {morekeywords={%
7139       % main elements
7140       xsl:stylesheet, xsl:transform,%
7141       % childs of the main element
7142       xsl:apply-imports, xsl:attribute-set, xsl:decimal-format, xsl:import,%
7143       xsl:include, xsl:key, xsl:namespace-alias, xsl:output, xsl:param,%
7144       xsl:preserve-space, xsl:strip-space, xsl:template, xsl:variable,%
7145       % 21 directives
7146       xsl:apply-imports, xsl:apply-templates, xsl:attribute,%
7147       xsl:call-template, xsl:choose, xsl:comment, xsl:copy, xsl:copy-of,%
7148       xsl:element, xsl:fallback, xsl:for-each, xsl:if, xsl:message,%
7149       xsl:number, xsl:otherwise, xsl:processing-instruction, xsl:text,%
7150       xsl:value-of, xsl:variable, xsl:when, xsl:with-param},%
7151     alsodigit={-},%
7152     }%
7153 \lst@definelanguage{Ant}[]{XML}{%
7154     morekeywords={%
7155       project, target, patternset, include, exclude, excludesfile,%
7156       includesfile, filterset, filter, filtersfile, libfileset, custom,%
7157       classpath, fileset, none, depend, mapper, filename, not, date,%
7158       contains, selector, depth, or, and, present, majority, size, dirset,%
7159       filelist, pathelement, path, param, filterreader, extension,%
7160       filterchain, linecontainsregexp, regexp, classconstants, headfilter,%
7161       tabstospaces, striplinebreaks, tailfilter, stripjavacomments,%
7162       expandproperties, linecontains, replacetokens, token,%
7163       striplinecomments, comment, prefixlines, classfileset, rootfileset,%
7164       root, description, xmlcatalog, entity, dtd, substitution, extensionSet,%
7165       propertyfile, entry, vsscheckin, sql, transaction, cvspass, csc,%
7166       dirname, wlrun, wlclasspath, p4label, replaceregexp, get, jjtree,%
7167       sleep, jarlib, dependset, targetfileset, srcfileset, srcfilelist,%
7168       targetfilelist, zip, zipgroupfileset, zipfileset, patch, jspc, webapp,%
7169       style, test, arg, jvmarg, sysproperty, testlet, env, tstamp, format,%
7170       unwar, vsshistory, icontract, cvschangelog, user, p4submit, ccmcheckin,%
7171       p4change, bzip2, vssadd, javadoc, bottom, source, doctitle, header,%
7172       excludepackage, bootclasspath, doclet, taglet, packageset, sourcepath,%
7173       link, footer, package, group, title, tag, translate, signjar, vajload,%
7174       vajproject, jarlib, extensionset, WsdlToDotnet, buildnumber,%
7175       jpcovmerge, tomcat, ejbjar, weblogictoplink, jboss, borland, weblogic,%
7176       iplanet, jonas, support, websphere, wasclasspath, war, manifest,%
7177       attribute, section, metainf, lib, classes, webinf, rename, sequential,%
7178       serverdeploy, generic, property, move, copydir, cccheckin, wljspc,%
7179       fixcrlf, sosget, pathconvert, map, record, p4sync, exec, p4edit,%
7180       maudit, rulespath, searchpath, antlr, netrexxc, jpcovreport, reference,%
7181       filters, coveragepath, execon, targetfile, srcfile, ccmcheckout, ant,%
7182       xmlvalidate, xslt, iplanet, ccmcheckintask, gzip, native2ascii,%
7183       starteam, ear, archives, input, rmic, extdirs, compilerarg, checksum,%
7184       mail, bcc, message, cc, to, from, loadfile, vsscheckout, stylebook,%
7185       soscheckin, mimemail, stlabel, gunzip, concat, cab, touch, parallel,%
```

```
7186        splash, antcall, cccheckout, typedef, p4have, xmlproperty, copy,%
7187        tomcat, antstructure, ccmcreatetask, rpm, delete, replace,%
7188        replacefilter, replacetoken, replacevalue, mmetrics, waitfor, isfalse,%
7189        equals, available, filepath, os, filesmatch, istrue, isset, socket,%
7190        http, uptodate, srcfiles, untar, loadproperties, echoproperties,%
7191        vajexport, stcheckout, bunzip2, copyfile, vsscreate, ejbc, unjar,%
7192        tomcat, wsdltodotnet, mkdir, condition, cvs, commandline, marker,%
7193        argument, tempfile, junitreport, report, taskdef, echo, ccupdate, java,%
7194        renameext, vsslabel, basename, javadoc2, vsscp, tar, tarfileset,%
7195        tomcat, vajimport, setproxy, wlstop, p4counter, ilasm, soscheckout,%
7196        apply, ccuncheckout, jarlib, location, url, cvstagdiff, jlink,%
7197        mergefiles, addfiles, javacc, pvcs, pvcsproject, jarlib, options,%
7198        depends, chmod, jar, sound, fail, success, mparse, blgenclient, genkey,%
7199        dname, javah, class, ccmreconfigure, unzip, javac, src, p4add,%
7200        soslabel, jpcoverage, triggers, method, vssget, deltree, ddcreator},%
7201   deletekeywords={default},%
7202 }
```

7203 ⟨/lang1⟩

This is my first attempt to support XML. It is from 2000/07/18.

7204 ⟨∗lang1⟩

```
7205 \lst@definelanguage{XML}%
7206   {keywords={,CDATA,DOCTYPE,ATTLIST,termdef,ELEMENT,EMPTY,ANY,ID,%
7207       IDREF,IDREFS,ENTITY,ENTITIES,NMTOKEN,NMTOKENS,NOTATION,%
7208       INCLUDE,IGNORE,SYSTEM,PUBLIC,NDATA,PUBLIC,%
7209       PCDATA,REQUIRED,IMPLIED,FIXED,%%% preceded by #
7210       xml,xml:space,xml:lang,version,standalone,default,preserve},%
7211   alsoother=$,%
7212   alsoletter=:,%
7213   tag=**[s]<>,%
7214   morestring=[d]",% ??? doubled
7215   morestring=[d]',% ??? doubled
7216   MoreSelectCharTable=%
7217       \lst@CArgX--\relax\lst@DefDelimB{}{}%
7218           {\ifnum\lst@mode=\lst@tagmode\else
7219               \expandafter\@gobblethree
7220            \fi}%
7221           \lst@BeginComment\lst@commentmode{{\lst@commentstyle}}%
7222       \lst@CArgX--\relax\lst@DefDelimE{}{}{}%
7223           \lst@EndComment\lst@commentmode
7224       \lst@CArgX[CDATA[\relax\lst@CDef{}%
7225           {\ifnum\lst@mode=\lst@tagmode
7226               \expandafter\lst@BeginCDATA
7227            \else \expandafter\lst@CArgEmpty
7228            \fi}%
7229           \@empty
7230       \lst@CArgX]]\relax\lst@CDef{}%
7231           {\ifnum\lst@mode=\lst@GPmode
7232               \expandafter\lst@EndComment
7233            \else \expandafter\lst@CArgEmpty
7234            \fi}%
7235           \@empty
7236   }[keywords,comments,strings,html]%
```

154

And after receiving a bug report from Michael Niedermair I converted the version 0.21 contents of `MoreSelectCharTable` to version 1.0.

7237 ⟨/lang1⟩