

Appendix A

Formal Language Definitions for EdenLisp

1. Productions

Lisp implementation of a recursive descent parser for the following grammar

1. program	::=	statement
2. statement	::=	identifier = expression identifier = if relational_expr then statement else statement
3. expression	::=	term opr1 expr term
4. relational_expr	::=	"=" "<=" ">=" ">" "<" "/="
5. term	::=	factor opr2 term factor
6. factor	::=	unsigned const (id int real) signed const (int real) signed variable (id) "(" expression ")" function "(" factor ")" set constructor
7. opr1	::=	"+" "-"
8. opr2	::=	"*" "/"
9. int	::=	0 1 2 3 4 5 6 7 8 9
10. real	::=	int* "." int* int* "." "." int*
11. id	::=	a..z*[A..Z]*[int]*[_\$£#]
12. function	::=	basic Autolisp function Valid EdenLisp function AutoCAD command
13. set	::=	"[" expression "]"

2. Valid Operators in EdenLisp

Algebraic operators

+ - * / 1- 1+ ~ ABS EXP EXPT LOG REM SQRT ATAN COS GCD LSH MAX MIN
 SIN ASCII ATOI ATOF ANGLOS CHR FIX FLOAT ITOA LENGTH EVALID
 PROJN OBJECT POINT VSUM VDIFF VTRANS VSHEAR VSCALE WRITE LOCATE
 > >= /= = <= < IF THEN ELSE EQ EQUAL AND BOOLE LOGIOR LOGAND
 NOT NULL OR ATOM BOUNDP LISTP MINUSP NUMBERP ZEROP
 SIMPLEX COMPLEX MORPH STOL PEDGE CEDGE CGRAPH FOREST SHAPE ISOMORPH EXTRUDE
 ROTOBJ
 STRLEN STRCAT STRCASE SUBSTR ANGLE DISTANCE INTERS POLAR TRANS

Geometical/Draw functions

WIREFRAME SURFACE LINE PLINE _3DPOLY ARC CIRCLE SPLINE TXTWIN LABEL
 GRREAD GRTEXT GRDRAW GRCLEAR VPORTS TRANS HANDENT HINGEH hingeV
 ENTUPD ENTMOD ENTSEL ENTLAST ENTNEXT ENTDEL ENTGET OSNAP REDRAW GRAPHSCR

AutoLisp commands

ERROR _VER ALLOC APPEND APPLY ASSOC CAAAR CAAADR CAAAR CAADAR CAADDR
 CAADR CAAR CADAAR CADADR CADAR CADDAR CADDR CADDR CADR CAR CDAAAR CDAADR
 CDAAR CDADAR CDADDR CDADR CDAR CDDAAR CDDADR CDDAR CDDADR CDDDDR CDDDR CDDR
 CDR CLOSE COMMAND COND COND CONS DEFUN ENAME EVAL EXIT EXPAND FINDFILE
 FOREACH FUNCTION GETANGLE GETCORNER GETDIST GETINT GETKEYWORD GETORIENT
 GETPOINT GETREAL GETSTRING GETVAR INITGET LAMBDA LAST LIST LOAD MAPCAR MEM
 MEMBER MENCMD NTH OPEN PAGETB PAUSE PICKSET PRIN1 PRINC PRINT PROGN PROMPT
 QUIT QUOTE READ-CHAR READ-LINE REPEAT REVERSE SET SETQ SETVAR SSADD SSDEL
 SSGET SLENGTH SSMEMB SSNAME SUBST TBLNEXT TBLSEARCH TERPRI TRACE TYPE
 UNTRACE VER VMON WHILE WRITE-CHAR WRITE-LINE

Type words

INT REAL STR Lreal POINT Lstr LLstr LLreal LIST SYM FILE ENAME WIN FRAME
 LOCAL

3. Environment for each type or type group

1. type group that is input to the operation
2. list of ops and the return type after the op is performed

INT (+ . int) (* . int) (- . int) (/ . int) (1- . int) (1+ . int) (ABS .
 int) (REM . int) (GCD . int) (MAX . int) (MIN . int) (FLOAT . real)
 (CHR . str) (ITOA . str) (LIST . Lreal) (POINT . Lreal) (EVALID . int)

REAL (+ . real) (- . real) (* . real) (/ . real) (1- . real) (1+ . real)
 (REM . real) (ABS . real) (EXP . real) (LOG . real) (EXPT . real)
 (SIN . real) (ATAN . real) (COS . real) (SQRT . real) (GCD . real)
 (MAX . real) (MIN . real) (expt . int) (FIX . int) (RTOS . str)
 (ANGLOS . str) (LIST . Lreal) (POINT . Lreal) (EVALID . real)

STR (LIST . Lstr) (PEDGE . LLstr) (STRCASE . str) (STRCAT . str) (STOL .
 Lstr) (ASCII . int) (ATOI . int) (STRLEN . int) (ATOF . real) (EVALID
 . str)

LLREAL (LIST . LLreal) (PLUS . Lreal) (pt- . Lreal) (POINT . Lreal)
 (INTERSE . Lreal) (LENGTH . int) (DISTANCE . real) (ANGLE . real)
 (Vsum . Lreal) (Vdiff . Lreal) (LOCATE . Lreal) (Vtrans . Lreal)
 (Vshear . Lreal) (EVALID . Lreal) (PROJN . real)

LLREAL (Vsum . Lreal) (Vdiff . Lreal) (PEDGE . LLreal) (CEDGE . LLreal)
 (CGRAPH . LLreal) (FOREST . LLreal) (EVALID . LLreal)

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LSTR (LIST . LLstr) (PEDGE . LLstr) (CEDGE . LLstr) (CGRAPH . LLstr)
(FOREST . LLstr) (EXTRUDE . LLstr) (SHAPE . LLstr) (STRCAT . STR)
(MKPOLY . LLstr) (MORPH . LLstr) (EVALID . Lstr)

INT LREAL (PROJN . real)
INT LLREAL (PROJN . Lreal)

STR LLSTR (ISOMORPH . LLstr)
STR INT (SUBSTR . str)

LLSTR (COMPLEX . LLreal)

LREAL REAL (POLAR . Lreal) (VScale . Lreal)
LREAL REAL STR (TXTWIN . str) (LABEL . str)
LREAL LLREAL (PROJN . Lreal)

LLREAL REAL (VSCALE . LLreal) (ROTOBJ . LLreal)
LLREAL LREAL (VSHEAR . LLreal) (VTRANS . LLreal) (OBJECT . LLreal)
LLREAL STR (WIREFRAME . LLreal)