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TECH MEMO



a working paper

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Author Delivered

LISP II PROJECT

MEMO NO. 17

LISP II PRIMITIVES

Abstract

A preliminary list and cursory description of LISP II primitives, to the extent known at this time, is provided below. This list will be expanded, modified, completed and maintained on punched cards during the implementation phase of LISP II, and published periodically. Final publication of these primitives with expanded descriptions will be released as part of the contract specified documentation. The purpose herein is to provide a concise, current status statement of requisite primitives for implementation personnel. Comments are solicited. Speak now or forever hold your peace.

KEY...

ARG, VALUE TYPES	CODER	STATUS	NO. ARGS
R=REAL	C=CLARK WEISSMAN	=NONE	0-9=COUNT
I=INTEGER	D=DONNA FIRTH	A=NOT IN NOV.17 LISP II	I=INDEF.
O=OCTAL	E=ERWIN BOOK	0=	
B=BOOLEAN	J=JEFF BARNETT	1=PARTIALLY SPECIFIED	
A=ARRAY	L=LOWELL HAWKINSON	2=SPECIFIED	
S=STRING	M=MIKE LEVIN	3=PARTIALLY CODED	
D=IDENTIFIER	R=BOB SAUNDERS	4=CODED	
M=SYMBOL	S=STAN KAMENY	5=PARTIALLY DEBUGGED	
F=FORMAL		6=DEBUGGED	
T=D/B/R/I/O		7=PARTIALLY DOCUMENTED	
,=OR		8=CODED,DEBUGGED,DOCUMENTED	
.=AND		9=	

FN NAME	S	FN	N	ARG	COMMENTS	FN	I	CS
	E	V	D	T		C	N	OT
	C	A	A	R		L	D	DA
	T	R	R	P		A	E	E
	I	L	A	E		S	X	R
	O	U	G	S		S		U
	N	E	S	S				S
PLUS	R,I	1R,I		1	FVAL IS I,UNLESS ANY ARG IS R.	ARITH		J
TIMES	R,I	1R,I		1	FVAL IS I,UNLESS ANY ARG IS R.	ARITH		
DIFFERENCE	R,I	2R,I		1	FVAL IS I,UNLESS ANY ARG IS R.	ARITH		
QUOTIENT	R	2R			ARG2 NON-0.	ARITH		
RECIP	R	1R			FOR ARG NON-0,= QUOTIENT(1. ARG).	ARITH		
IQUOTIENT	I	2I			ENTIER(ARG1)/ENTIER(ARG2).	ARITH		
REMAINDER	I	2I			FVAL SIGN IS SAME AS ARG1.	ARITH		
ABS	R,I	1R,I		1	FVAL IS SAME TYPE AS ARG.	ARITH		
MINUS	R,I	1R,I		1	FVAL IS SAME TYPE AS ARG.	ARITH		
ENTIER	I	1R			FVAL IS GREATEST INTEGER LQ ARG.	ACONV		
ROUND	I	1R			=ENTIER(ARG+.5).	ACONV		
SIGN	I	1R,I		1	FVAL IS -1,0,+1 APPROPRIATELY.	ARITH		
EXPT	R,I	2R,I		1	AS ALGOL,WITH 2 EXTENTIONS.	ARITH		
EXP	R	1R			E TO THE ARG.	ARITH		
LOG	R	1R			BASE E.	ARITH		
SIN	R	1R			ARG IN RADIANS.	ARITH		
COS	R	1R			ARG IN RADIANS.	ARITH		
ARCTAN	R	1R			VALUE IN RADIANS,RANGE -PI/2 TO +PI/2	ARITH		
SQRT	R	1R			ARG LS 0 IS AN ERROR.	ARITH		

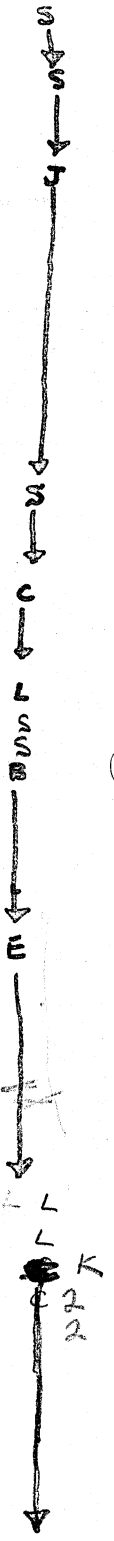
FORM 2 SYM
SYM 2 FORM

SYM2OCT	O	1M	UNBOXT	SCONV
SYM2INT	I	1M	UNBOXT	SCONV
SYM2REAL	R	1M	UNBOXT	SCONV
O2S.	M	1O	DANGEROUS	CHEAT
O2L.		1O	OCTAL TO LOCATIVE	CHEAT
L2O.	O	1	LOCATIVE TO OCTAL	CHEAT
O2I.	I	1O	OCTAL TO INTEGER	CHEAT
I2O.	O	1I	INTEGER TO OCTAL	CHEAT
O2B.	B	1O	OCTAL TO BOOLEAN	CHEAT
B2O.	O	1B	BOOLEAN TO OCTAL	CHEAT
O2R.	R	1O	OCTAL TO REAL	CHEAT
R2O.	O	1R	REAL TO OCTAL	CHEAT
S2O.	O	1M	SYMBOL TO OCTAL	CHEAT
PROP	M	1D	EXTRACT OR SET PROPERTY LIST OF ID ARG	MISC
BIT	O	3I	I.O EXTRACT, OR SET SELECTED BITS OF WORD	MISC
BYTE	O	3I	I.O EXTRACT, OR SET SELECTED BYTES OF WORD	MISC
LENGTH	I	1M	LIKE LISPI.5 COUNTERPART	MISC
APPEND	M	2M	LIKE LISPI.5 COUNTERPART	MISC
MEMBER	B	2M	LIKE LISPI.5 COUNTERPART	MISC
TYPE	M	1M	RETURNS PARAMETER TYPE OF VARIABLE	MISC
GENID	D	O	LIKE LISPI.5 GENSYM, HERE YIELDS IDENTIFIER	MISC
AND	B	1M	LEFT TO R EVAL OF ARGS UNTIL VAL DTRM	BOOL
OR	B	1M	LEFT TO R EVAL OF ARGS UNTIL VAL DTRM	BOOL
XOR	B	1M	EVAL ALL ARGS	BOOL
NULL	B	1M	LIKE LISPI.5 NULL	BOOL
IMPLIES	B	2M	TRUE IF ARG1 IMPLIES ARG2	BOOL
EQUIV	B	2M	TRUE IF EQUALN ARG1 ARG2	BOOL
H2OCT	O	1D	ASCII TO OCT	CONV
OCT2H	D	1O	OCT TO ASCII	CONV
EXPLODE	M	1S	STRNG TO LIST OF CHARS	CONV
COMPRESS	S	1M	LIST OF CHARS TO STRING	CONV
TOSTRG	M	1D,B,R,I,O	TOKEN TO STRING	CONV
TOCHARS	M	1D,B,R,I,O	GENERALIZED EXPLODE	CONV
FROMSTRG	T	1S	T= D,B,R,I,O STRING TO TOKEN	CONV
FROMCHARS	T	1M	T= D,B,R,I,O LIST OF CHARS TO TOKEN	CONV
GETID	D,B	1S	FVAL IS ID OR FALSE	CONV
MAKEID	D	1S	STRING TO IDENTIFIER	CONV
STRINGL	I	1S	NUMBER OF CHARACTERS IN THE STRING	STRNG
ENDINR	IOB	O	LOADS SELECTED IO FILE FROM EXTERNAL UNIT	I/O
ENDOUTR	IOB	O	UNLOADS SELECTED IO FILE TO EXTERNAL UNIT	I/O
PRINWORD	IOO	1O	ENTERS BINARY WORD IN SELECTED IO FILE	I/O
READWORD	IOO	1O	READS NEXT BINARY WORD OF SELECTED IO FILE	I/O
HORIZONTAL	IOO	5I	I.F.I.F SETS LM, RM, MAX COL, + OVERFLOW FN'S	I/O
VERTICAL	IOO	5I	I.F.I.F SETS TOP, BOT, MAX LINE, + OVERFLOW FN'S	I/O
TAB	IOI	2D	I TABS NEXT LINE OF SPECIFIED IO FILE TO COL N	I/O
COLUMN	IOI	2D	RETURNS CURRENT COL OF SPECIFIED IO FILE	I/O
ROLL	IOI	2D	I Rolls specified file to LINE N relative to Top	I/O

GET-4
MISC

MEMBER
MISC

GENID
MISC



also bumps sumline by N, or if N to big, to TOP next page

relative to TOP

LINE	IOI	DESCRIPTION	I/O
OPEN	M	2D.M FILE D OPENED WITH FILE DESCRIPTION M	I/O
SHUT	M	2D.M FILE D SHUT WITH FILE DISPOSITION M	I/O
ENDIN	B	0 LIKE LISPL.5 TEREAD,USES ENDINR IF FILE EMPTY	I/O
ENDOUT	B	0 LIKE LISPL.5 TERPRI,USES ENDOUTR IF FILE FULL	I/O
READCH	D	0 RETURNS NEXT CHAR ID IN SELECTED IO FILE,OR NIL	I/O
PRINCH	D	1D ENTERS CHAR ID IN NEXT COL OF SELECTED IO FILE	I/O
INPUT	D	1D READ SELECTS IO FILE,RETURNS PRIOR FILE NAME	I/O
OUTPUT	D	1D WRITE SELECTS IO FILE,RETURNS PRIOR FILE NAME	I/O
POSITION	D,I	2D.I APPROPRIATELY POSITIONS IO FILE	I/O
READ	M	0 READS NEXT S-EXP IN SELECTED IO FILE,NO ENDIN	I/O
PRINT	M	1M PRINTS S-EXP IN SELECTED IO FILE,WITH ENDOUT	I/O
IOSTATUS	I	0 GIVES STATUS OF PRIOR IO XFER,RESOLVES EOF READ	I/O
PRINSTRING	S	1S ENTERS STRING IN SELECTED IO FILE,NO ENDOUT	I/O
SYMPRINT	S	1S SYMPRIN PLUS ENDOUT	I/O
SYMPRIN	S	1S PRINSTRING FOR UNUSUAL SPELLINGS,READ SYMETRY	I/O
PRINTOKEN	T	1T PRINTS ANY TOKEN IN SELECTED IO FILE,NO ENDOUT	I/O
PRIN	M	1M LIKE PRINT,BUT NO ENDOUT	I/O

C 2
2
4
4
1
2
2
E 4
4
4
4
4

SET *local*

T=SYMETRY
FEW

LOCSET

~~PRINSTR~~

IF
BLOCK

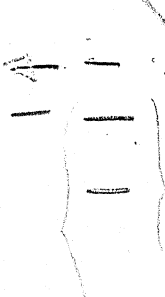
~~PRINSTR~~
PRINSTR

~~SHADE~~

FOR

MACRO S

TYPE SYMBOL (Boolean, FD, string



PRINSTRING uses value

Clark

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F=FORMAL		6=DEBUGGED	
T=D/B/R/I/O		7=PARTIALLY DOCUMENTED	
,=OR		8=CODED, DEBUGGED, DOCUMENTED	
.=AND		9=	

FN NAME	S	FN	N	ARG	COMMENTS	FN	I	CS
	E		O				N	OT
	C	V		T		C	D	DA
	T	A		Y		L	E	ET
	I	L		P		A	A	RU
	C	U		E		S		S
	N	E		S		S		

-ROUND OFF	R	2	R	R		-LIMBC		C2
-RESET	I	0	D		<i>no file</i>	-LIMBC		C2
CLEAR	I	0	0		<i>clears (round) to blank or zero (binary)</i>	limbc		C2
LENGTH	I	1	M		LIKE LISPL.5 COUNTERPART	MISC		C2
APPEND	M	2	M		LIKE LISPL.5 COUNTERPART	MISC		C2
MEMBER	B	2	M		LIKE LISPL.5 COUNTERPART	MISC		C2
STRINGL	I	1	S		NUMBER OF CHARACTERS IN THE STRING	STRNG		C2
ENDINR	I	0	0		LOADS SELECTED IO FILE FROM EXTERNAL UNIT	I/O		C2
ENDOUTR	I	0	0		UNLOADS SELECTED IO FILE TO EXTERNAL UNIT	I/O		C2
PRINWORD	I	0	1		ENTERS BINARY WORD IN SELECTED IO FILE	I/O		C2
READWORD	I	0	1		READS NEXT BINARY WORD OF SELECTED IO FILE	I/O		C2
HORIZONTAL	I	0	0		<i>D. M. F. F</i> SETS LM, RM, MAX COL, +0 OVERFLOW FN'S	I/O		C2
VERTICAL	I	0	0		<i>D. M. F. F</i> SETS TOP, BOT, MAX LINE, +0 OVERFLOW FN'S	I/O		C2
TAB	I	0	1		0.1 TABS NEXT LINE OF SPECIFIED IO FILE TO COL N	I/O		C2
COLUMN	I	0	1		RETURNS CURRENT COL OF SPECIFIED IO FILE	I/O		C2
LINE	I	0	1		RETURNS CURRENT LINE NO OF SPECIFIED IO FILE	I/O		C2
OPEN	M	2	M		M FILE D OPENED WITH FILE DESCRIPTION M	I/O		C2
SHUT	M	2	M		M FILE D SHUT WITH FILE DISPOSITION M	I/O		C2
ENDIN	I	0	0		LIKE LISPL.5 TEREAD, USES ENDINR IF FILE EMPTY	I/O		C2
ENDOUT	I	0	0		LIKE LISPL.5 TERPRI, USES ENDOUTR IF FILE FULL	I/O		C2
READCH	I	0	0		RETURNS NEXT CHAR ID IN SELECTED IO FILE, OR NIL	I/O		C2
PRINCH	I	0	1		ENTERS CHAR ID IN NEXT COL OF SELECTED IO FILE	I/O		C2
INPUT	I	0	1		READ SELECTS IO FILE, RETURNS PRIOR FILE NAME	I/O		C2
OUTPUT	I	0	1		WRITE SELECTS IO FILE, RETURNS PRIOR FILE NAME	I/O		C2
POSITION	I	0	1, 2		0.1 APPROPRIATELY POSITIONS IO FILE	I/O		C2
PRINT	M	1	M		PRINTS S-EXP IN SELECTED IO FILE, WITH ENDOUT	I/O		C2
IOSTATUS	I	0	0		GIVES STATUS OF PRIOR IO XFER, RESOLVES EOF READ	I/O		C2
PRINSTRING	S	1	S		ENTERS STRING IN SELECTED IO FILE, NO ENDOUT	I/O		C2
SYMPRINT	S	1	S		SYMPRINT PLUS ENDOUT	I/O		C2
SYMPRIN	S	1	S		PRINSTRING FOR UNUSUAL SPELLINGS, READ SYMETRY	I/O		C2
PRINTOKEN	T	1	T		PRINTS ANY TOKEN IN SELECTED IO FILE, NO ENDOUT	I/O		C2
PRIN	M	1	M		LIKE PRINT, BUT NO ENDOUT	I/O		C2
ROLL	I	2	0		0.1 ROLLS PAGE OF SPECIFIED FILE TO LINE N	I/O		C2

roll } *10/ standard overflow - PAs*