IDENTIFICATION

Micro Muddle Manual

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MOTIVATION

The following is a very brief description of all the basic primitives currently available in MUDDLE. These descriptions are in no way intended to be a primer on MUDDLE programming. Neither are they to be considered a definition of the effects or values produced by the primitives. I have tried to be as complete and as accurate as is possible in a single statement description. However, because of the complexity of most primitives, many important defaults and restrictions have been omitted. It is hoped that by using this manual the user can be aware of what facilities exist and then look elsewhere for a precise definition of those primitives which he believes might be useful.

DESCRIPTION

A given description contains three pieces of information about each primitive: its name, its description, and the number of arguments it takes. The name is just the text that is used to refer to each primitive. Also indicated is whether the primitive evaluates its arguments (SUBR) or doesn't evaluate its arguments (FSUBR). Even though all primitives return a value, some

descriptions only mention the side effects produced by a

primitive. These primitives are most often used for this effect

rather than the value, so the value is omitted. The third field

indicates how many arguments the primitive can and usually must

be supplied.

FUNCTION	DESCRIPTION	NUMBER OF ARGS
* SUBR	Arithmetic: multiplication	any
+ SUBR	Arithmetic: addition	any
- SUBR	Arithmetic: subtraction	any
/ SUBR	Arithmetic: division	any
0? SUBR	Predicate: equality to number zero	1
1? SUBR	Predicate: equality to number one	1
==? SUBR	Predicate: "exact" equality (sharing)	2
=? SUBR	Predicate: "structural" equality	2
ABS SUBR	Arithmetic: absolute value	1
AGAIN SUBR	Restarts a given activation block	0-1
ALLTYPES SUBR	Returns a vector of all currently known data types	0
AND FSUBR	Logical: "and" of truthvalues	any
ARGS SUBR	Returns arguments of a given FRAME	1
ASCII SUBR	Returns character with a given "ASCII" code	1
ASSIGNED? SUBR	Predicate: is an ATOM locally assigned	1
AT SUBR	Returns a LOCATIVE to the nth element of a structure	1-2
ATAN SUBR	Arithmetic: arc tangent	1
ATOM SUBR	Creates an ATOM with a given name	1

BACK	SUBR	Replaces some items removed from a non-LIST stucture by RESTing	1-2
BITS	SUBR	Returns the specification of a bit field in a WORD	0-2
BLOCK	SUBR	Creates a new path of OBLISTs for READing	1
BOUND?	SUBR	Predicate: is an ATOM locally bound	1
CHANLIST	SUBR	Returns a LIST of currently open CHANNELS for I/O	0
CHANNEL	SUBR	Creates a CHANNEL for I/O	0-5
CHTYPE	SUBR	Changes the data type of an item	2
CHUTYPE	SUBR	Changes the data type of the elements of a UVECTOR	2
CLOSE	SUBR	Closes a CHANNEL for I/O	1
CLOSURE	SUBR	Binds the free variables of a FUNCTION to current values	1-more
COND	FSUBR	Conditional evaluation of expressions	any
CONS	SUBR	Adds an item to the front of a LIST	2
COS	SUBR	Arithmetic: cosine	1
CREATE	SUBR	Creates a new PROCESS	1
ECHOPAIR	SUBR	Sets up CHANNELs for echoing characters on rubout	2
EMPTY?	SUBR	Predicate: does a structure have zero elements	1
ENDBLOCK	SUBR	Restores previous path of OBLISTs before last call to BLOCK	0
ERRET	SUBR	Proceeds evaluation from the last ERROR or LISTEN	0-2

ERROR SUBR	Stops and informs user of an error	any
ERRORS SUBR	Returns the OBLIST where error messages are located	0
EVAL SUBR	Evaluates an expression in a given environment	1-2
EXIT SUBR	Leaves an activation block with a given value	2
EXP SUBR	Arithmetic: exponentiation to the base "e"	1
FAIL SUBR	PLANNER primitive	0-2
FAILPOINT FSUBR	PLANNER primitive	1
FALSE SUBR	Predicate: returns truthvalue of "false"	0-1
FINIALIZE SUBR	PLANNER primitive	1
FIX SUBR	Arithmetic: returns FIX value of a number	1
FLATSIZE SUBR	Returns number of characters needed to print an item	2
FLOAD SUBR	Reads and evaluates all items of a file	0-5
FLOAT SUBR	Arithmetic: returns FLOAT value of a number	1
FRAME SUBR	Returns a previous FRAME	0-1
FUNCT SUBR	Returns function name of a given FRAME	1
FUNCTION FSUBR	Creates a FUNCTION	2-more
G? SUBR	Predicate: is first argument numerically greater than second	2
GASSIGNED? SUBR	Predicate: is an ATOM globally assigned	1
GET SUBR	Returns a given property associated with an item	2-3

GETBITS SUBR	Extracts a specified bit field from a WORD	2
GETINT SUBR	Returns the number of the most recent interrupt	0
GETPROP SUBR	A more general version of GET	2-3
GLOC SUBR	Returns a LOCATIVE to the global value cell of an ATOM	1
GO SUBR	Goes to a tag and continues evaluation from there	1
GROW SUBR	Extends the bounds of a VECTOR or UVECTOR	3
GVAL SUBR	Returns the global value of an ATOM	1
ILIST SUBR	Creates a LIST with implict elements	1-2
IN SUBR	Returns the item pointed to by a LOCATIVE	1
INSERT SUBR	Adds an ATOM to an OBLIST	2
INTCHAN SUBR	Returns the number of the most recent channel to be interrupted	0
INTCHAR SUBR	Returns an interrupt level CHARACTER from a CHANNEL	1
INTERN SUBR	Inserts an ATOM IN a given OBLIST	2
INTERRUPTS SUBR	Returns the OBLIST on which interrupt routines are kept	0
ISTRING SUBR	Creates a STRING with implicit elements	1-2
IUVECTOR SUBR	Creates a UVECTOR with implicit elements	1-2
IVECTOR SUBR	Creates a VECTOR with implicit elements	1-2
L? SUBR	Predicate: is first argument numerically less than the second	2

LENGTH SUBR	Returns the number of elements in a structure	1
LIST SUBR	Creates a LIST with explicit elements	any
LISTEN SUBR	Stops and informs user that you are waiting	any
LLOC SUBR	Returns a LOCATIVE to the local value cell of an ATOM	1
LOAD SUBR	Reads and evaluates all items from a CHANNEL	1-2
LOG SUBR	Arithmetic: natural logarithm	1
LOOKUP SUBR	Returns an ATOM found on a given OBLIST	2
LVAL SUBR	Returns the local value of an ATOM	1
MAX SUBR	Arithmetic: maximum argument	any
MEMBER SUBR	Predicate: is item =? to some element of a structure	2
MEMQ SUBR	Predicate: is item ==? to some element of a structure	2
MIN SUBR	Arithmetic: minimum argument	any
MOBLIST SUBR	Creates an OBLIST	0-1
MOD SUBR	Arithmetic: numerical modulus or remainder	2
MONAD? SUBR	Predicate: is item unstructured or else EMPTY? structure	1
NEWTYPE SUBR	Defines a new data type	2
NEXTCHR SUBR	Returns the next CHARACTER from a CHANNEL	0-3
NOT SUBR	Logical: "not" of a truthvalue	1
NTH SUBR	Returns the nth element of a stucture	1-2

OBLIST? SUBR	Predicate: is ATOM on an OBLIST	1
ONCHAR SUBR	Assigns an interrupt routine for a given CHANNEL	2-3
ONCLOCK SUBR	Assigns an interrupt rooutine for the slow clock break	1-2
OPEN SUBR	Creates and opens a CHANNEL for I/O	0-5
OR FSUBR	Logical: "or" of truthvalues	any
PNAME SUBR	Returns a STRING which is the printing name of the ATOM	1
PRIMTYPE SUBR	Returns the primitive data type of an item	1
PRIN1 SUBR	Prints an item on a CHANNEL without formating	1-2
PRINC SUBR	Prints an item on a CHANNEL without formating or indicators	1-2
PRINT SUBR	Prints an item on a CHANNEL	1-2
PROG FSUBR	Executes sequential expressions	2-more
PUT SUBR	Associates a property with an item	2-3
PUT1 SUBR	Associates a property with an item	2-3
PUTBITS SUBR	Inserts a given bit field into a WORD	2-3
PUTN SUBR	Special version of PUT	2-3
PUTPROP SUBR	More general version of PUT	2-3
PUTREST SUBR	Replaces the REST of a LIST	2
QUITTER SUBR	Interrupt routine to handle !G quit feature	0
QUOTE FSUBR	Returns its argument unevaluated	1
RANDOM SUBR	Arithmetic: generate a uniform random fixed number	0-2

READ SUBR	Reads one item from a CHANNEL	0-3
READCHR SUBR	Reads the next CHARACTER from a CHANNEL	0-3
REMOVE SUBR	Removes an ATOM from an OBLIST	2
REPEAT FSUBR	Executes repeatedly sequential expressions	2-more
RESET SUBR	Flushes the buffer of an I/O channel	1
REST SUBR	Removes the first n elements from a structure	1-2
RESTORE SUBR	PLANNER primitive	1-2
RESUME FSUBR	Restarts a PROCESS	1-2
RETURN SUBR	Leaves the most recent activation block with a given value	1
RSUBR SUBR	Generates a relocatable SUBR (used by the COMPILER)	1
ROOT SUBR	Returns the OBLIST containing primitives	0
SET SUBR	Changes the local value of an ATOM	2
SETG SUBR	Changes the global value of an ATOM	2
SETINT SUBR	Assigns an interrupt routine to a given interrupt number	2
SETLOC SUBR	Changes the contents pointed at by a LOCATIVE	2
SIN SUBR	Arithmetic: sine	1
SORT SUBR	Arithmetic: numerical sort of elements of a structure	1-2
SQRT SUBR	Arithmetic: square root	1
STACKFORM FSUBR	Applies a FUNCTION to arguments	3

STRING SUBR	Creates a STRING with explicit elements	any
TAG SUBR	Creates a tag in an activation block	1-2
TERPRI SUBR	Prints a carriage return on a CHANNEL	0-1
TIME SUBR	Returns the system up in 30ths of a second	0
TOP SUBR	Replaces all items removed from a non-LIST structure by RESTing	1
TYPE SUBR	Returns the data type of an item	1
UTYPE SUBR	Returns the the data type of the elements of a UVECTOR	1
UVECTOR SUBR	Creates a UVECTOR with explicit elements	any
VALUE SUBR	Returns the local or else the global value of an ATOM	1
VECTOR SUBR	Creates a VECTOR with explicit elements	any