E → VAR ARITHM_OP VAR | VAR ARITHM_OP VAL

Basic arithmetic functions

FUNCTIONS →

```
log2(VAR) # logarithms base 2 of x
log10(VAR) # logaritms base 10 of x
exp(VAR) # Exponential of x
cos(VAR) # Cosine of x
sin(VAR) # Sine of x
tan(VAR) #Tangent of x
acos(VAR) # arc-cosine of x
asin(VAR) # arc-sine of x
atan(VAR) #arc-tangent of x
abs(VAR) # absolute value of x
sqrt(VAR) # square root of x
```

STAT_FUNCTIONS →

```
max(VAR)
min(VAR)
range(VAR)
length(VAR)
sum(VAR)
prod(VAR)
```

```
mean(VAR)

sd(VAR) # Standard deviation

var(VAR)

sort(VAR)
```

Assigning values to variables

VARS → VAR | VAR,VAR
VAR → CHARACTER COMB
| ._COMB
| .CHARACTER COMB

COMB → . | _ | CHARACTER | D | COMB COMB | eps
/*

- VAL → VECTOR # to add at the end

*/
A → VAR ASSIGN EXP
ASSIGN → <- | =
PRINT → VAR | print(VAR)
LIST → ls()

REMOVE → rm(VARS)

Basic data types

BASIC_TYPE → LOGICAL | NUMERIC | STRING | COMPLEX

COMPLEX → Di

LOGICAL → TRUE | FALSE | T | F

NUMERIC → INTEGER | DOUBLE
INTEGER → DL | DedL | -DL | -DedL | +DL | +DedL
d → 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
D → dD | d
DOUBLE → D | .D | D.D | D.Ded | +D | +.D | +D.D | +D.Ded | -D | -.D | -D.D | -D.Ded

STRING → “CHAINE” | ‘CHAINE’
CHAINE → CHARACTER CHAINE | CHAINE\’CHARACTER |
CHAINE\”CHARACTER |CHARACTER
CHARACTER → a | b | c … | z | A | … | Z

TYPE → typeof(BASIC_TYPE) | typeof(VAR)

TEST_TYPE → is.numeric(VAR) | is.character(VAR) | is.logical(VAR) |
is.complex(VAR)

CONVERT → as.numeric(VAR) | as.character(VAR) | as.logical(VAR)
/*
* Conversion d’un string to numeric est possible : returns NA (not available)
*/

Vectors

VECTOR → c(CL) | c(CN) | c(TI) | c(TS) | c(TV) | c(TL)
| c(CS,CN,TL) | c(CS,CN) | c(TS,TL)
| c(CN,CL)
| c(CNAMED)

CNAMED → CNAMED_N | CNAMED_L | CNAMED _S
CNAMED_N → CHAINE = NA | CHAINE = NUMERIC | CHAINE = NUMERIC ,
CNAMED_N | CHAINE = NA, CNAMED_N
CNAMED_L → CHAINE = NA | CHAINE = LOGICAL | CHAINE = LOGICAL ,
CNAMED_L | CHAINE = NA, CNAMED_L
CNAMED_S → CHAINE = NA | CHAINE = STRING | CHAINE = STRING ,
CNAMED_S | CHAINE = NA, CNAMED_S

CHECK_NA → is.na(VAR)
CHECK_NAN → is.nan(VAR)
CL → LOGICAL,CL | LOGICAL
CN → NUMERIC,CN | NUMERIC
CS → STRING,CS | STRING
ELEMENT_NAMES → names(VAR) |

LENGTH → length(VAR)

SUBSET_VECTOR → var[D] | var[D:D] | var[c(D,D)] | var[STRING]
EXCLUDE_ELEMENT → var[-D] | var[-c(D,D)] | VAR [-(D:D)]ù

SELECT_ELEMENT → var[var LOG_OP BASIC_TYPE] | var [!CHECK_NA]
LOG_OP → == | != | >= | <= | < | >

Matrices

Factors

Data frames