```
Programma : Global Functions

Global : GLOBAL Var_decls END
              | ε

Functions : Def_fun Functions
                 | Def_fun

Def_fun : FUNCTION ID LPAR Par_decls RPAR COLON Type Statements END

Def_fun : FUNCTION ID LPAR RPAR COLON Type Statements END


Par_decls : ID COLON Type COMMA Par_decls
          | ID COLON Type

Var_decls : ID COLON Type Var_init_value SEMI Var_decls
          | ID COLON Type Var_init_value

Var_init_value : ASSIGN Expr
                 | ε


Type : NIL | INT | BOOL | FLOAT | STRING
     | BLPAR Type BRPAR
     | LPAR Types RPAR ARROW Type
     | LPAR RPAR ARROW Type

Types : Type COMMA Types
          | Type

Statements : Stat SEMI Statements
                 | Stat


Stat :  NOP
          | WHILE Expr DO Statements END
          | IF Expr THEN Statements ELSE Statements END
          | IF Expr THEN Statements END
          | FOR ID ASSIGN Expr COMMA Expr DO Statements END
          | LOCAL Var_decls SEMI Statements END
          | ID ASSIGN Expr
          | Expr SLPAR Expr SRPAR ASSIGN Expr
          | ID LPAR Exprs RPAR
          | Vars READ
          | Exprs WRITE
          | RETURN Expr


Vars : ID COMMA Vars
         | ID

Exprs : Expr COMMA Exprs
                 | Expr
```

```
Expr : NIL
     | TRUE
     | FALSE
     | INT_CONST
     | FLOAT_CONST
     | STRING_CONST
     | BLPAR BRPAR COLON Type
     | ID
     | Expr SLPAR Expr SRPAR
     | ID LPAR Exprs RPAR
     | Expr PLUS Expr
     | Expr MINUS Expr
     | Expr TIMES Expr
     | Expr DIV Expr
     | Expr AND Expr
     | Expr OR Expr
     | Expr GT Expr
     | Expr GE Expr
     | Expr LT Expr
     | Expr LE Expr
     | Expr EQ Expr
     | Expr NE Expr
     | MINUS Expr
     | NOT Expr
     | SHARP Expr
```

Specifica lessicale

```
FUNCTION "function"
MAIN     "main"
LPAR     "("
RPAR     ")"
END      "end"
ID       Java id format
COLON    ":"
GLOBAL   {"global"}
SEMI     ";"
COMMA    ","
NIL      "nil"
INT      "int"
BOOL     "bool"
FLOAT    "float"
STRING   "string"
BLPAR    "{"
BRPAR    "}"
ARROW    "->"
ASSIGN   "="
```

```
NOP        "nop"
WHILE      "while"
DO         "do"
IF         "if"
THEN       "then"
ELSE       "else"
FOR        "for"
LOCAL      "local"
SLPAR      "["
SRPAR      "]"
READ       "<=="
WRITE      "==>"
RETURN     "return"
TRUE       "true"
FALSE      "false"
INT_CONST          Java Decimal integer format
FLOAT_CONST        Java float format
STRING_CONST       Java format constant format
PLUS       "+"
MINUS      "-"
TIMES      "*"
DIV        "/"
AND        "and"
OR         "or"
GT         ">"
GE         ">="
LT         "<"
LE         "<="
EQ         "=="
NE         "!="
NOT        "not"
SHARP      "#"
```