## Teste 1

Arquivo de entrada:

```
module Teste;
 VAR b,c : INTEGER;
 PROCEDURE proc () : INTEGER;
 begin
          b:=a;
          while b<5 do
                   b:=b+1
                   end
end proc;

begin
b:=a;
c:=a=b-1;
if b>c then writeln
elsif b>a then read(a);
end
end Teste.
```

Arquivo de saída .ast:

```
Module(
  Teste
  Declarations(
    Decl_list0(
      Decl_list1(
        Const_opt1(
        ) [Const_opt1]
        Var_opt0(
          Vardecl(
            null
            Idlist0(
              Idlist1(
                b
              ) [Idlist1]
              c
            ) [Idlist0]
            null
          ) [Vardecl]
        ) [Var_opt0]
      ) [Decl_list1]
      Procdecl(
```

```
Procheader(
  Formalpars(
    Formalpars_op1(
    ) [Formalpars_op1]
  ) [Formalpars]
  Procheader_op0(
    null
  ) [Procheader_op0]
) [Procheader]
Procdecl_op0(
  Procbody(
    Declarations(
      Decl_list1(
        Const_opt1(
        ) [Const_opt1]
        Var_opt1(
        ) [Var_opt1]
      ) [Decl_list1]
    ) [Declarations]
    Statements(
      Statements_list0(
        Statements_list1(
          Statement0(
            Assignment(
              Variable0(
                b
              ) [Variable0]
              Expression1(
                Andexp1(
                  Relexp1(
                    Aritexp1(
                      Term1(
                        Factor3(
                          Primary2(
                            Variable0(
                              a
                            ) [Variable0]
                          ) [Primary2]
                        ) [Factor3]
                      ) [Term1]
                    ) [Aritexp1]
                  ) [Relexp1]
                ) [Andexp1]
              ) [Expression1]
            ) [Assignment]
          ) [Statement0]
```

```
) [Statements_list1]
Statement2(
  Repetition0(
    WHILE
    Expression1(
      Andexp1(
        Relexp0(
          Aritexp1(
            Term1(
              Factor3(
                Primary2(
                  Variable0(
                    b
                  ) [Variable0]
                ) [Primary2]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp1]
          <
          Aritexp1(
            Term1(
              Factor3(
                Primary1(
                  Literal0(
                    5
                  ) [Literal0]
                ) [Primary1]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp1]
        ) [Relexp0]
      ) [Andexp1]
    ) [Expression1]
    DO
    Statements(
      Statements_list1(
        Statement0(
          Assignment(
            Variable0(
              b
            ) [Variable0]
            Expression1(
              Andexp1(
                Relexp1(
                  Aritexp0(
                    Aritexp1(
```

```
                                Term1(
                                  Factor3(
                                    Primary2(
                                      Variable0(
                                        b
                                      ) [Variable0]
                                    ) [Primary2]
                                  ) [Factor3]
                                ) [Term1]
                              ) [Aritexp1]
                              +
                              Term1(
                                Factor3(
                                  Primary1(
                                    Literal0(
                                      1
                                    ) [Literal0]
                                  ) [Primary1]
                                ) [Factor3]
                              ) [Term1]
                            ) [Aritexp0]
                          ) [Relexp1]
                        ) [Andexp1]
                      ) [Expression1]
                    ) [Assignment]
                  ) [Statement0]
                ) [Statements_list1]
              ) [Statements]
            ) [Repetition0]
          ) [Statement2]
        ) [Statements_list0]
      ) [Statements]
      proc
    ) [Procbody]
  ) [Procdecl_op0]
 ) [Procdecl]
) [Decl_list0]
) [Declarations]
Statements(
 Statements_list0(
  Statements_list0(
   Statements_list1(
    Statement0(
     Assignment(
      Variable0(
       b
```

```
      ) [Variable0]
      Expression1(
        Andexp1(
          Relexp1(
            Aritexp1(
              Term1(
                Factor3(
                  Primary2(
                    Variable0(
                      a
                    ) [Variable0]
                  ) [Primary2]
                ) [Factor3]
              ) [Term1]
            ) [Aritexp1]
          ) [Relexp1]
        ) [Andexp1]
      ) [Expression1]
    ) [Assignment]
  ) [Statement0]
) [Statements_list1]
Statement0(
  Assignment(
    Variable0(
      c
    ) [Variable0]
    Expression1(
      Andexp1(
        Relexp0(
          Aritexp1(
            Term1(
              Factor3(
                Primary2(
                  Variable0(
                    a
                  ) [Variable0]
                ) [Primary2]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp1]
          =
          Aritexp0(
            Aritexp1(
              Term1(
                Factor3(
                  Primary2(
```

```
                    Variable0(
                      b
                    ) [Variable0]
                  ) [Primary2]
                ) [Factor3]
              ) [Term1]
            ) [Aritexp1]
            -
            Term1(
              Factor3(
                Primary1(
                  Literal0(
                    1
                  ) [Literal0]
                ) [Primary1]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp0]
        ) [Relexp0]
      ) [Andexp1]
    ) [Expression1]
  ) [Assignment]
) [Statement0]
) [Statements_list0]
Statement1(
  Conditional0(
    Conditional_list0(
      Conditional_list1(
        IF
        Expression1(
          Andexp1(
            Relexp0(
              Aritexp1(
                Term1(
                  Factor3(
                    Primary2(
                      Variable0(
                        b
                      ) [Variable0]
                    ) [Primary2]
                  ) [Factor3]
                ) [Term1]
              ) [Aritexp1]
              >
              Aritexp1(
                Term1(
```

```
            Factor3(
              Primary2(
                Variable0(
                  c
                ) [Variable0]
              ) [Primary2]
            ) [Factor3]
          ) [Term1]
        ) [Aritexp1]
      ) [Relexp0]
    ) [Andexp1]
  ) [Expression1]
  THEN
  Statements(
    Statements_list1(
      Statement4(
        NOVALINHAio_statement(
        ) [NOVALINHAio_statement]
      ) [Statement4]
    ) [Statements_list1]
  ) [Statements]
) [Conditional_list1]
ELSEIF
Expression1(
  Andexp1(
    Relexp0(
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable0(
                b
              ) [Variable0]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
      >
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable0(
                a
              ) [Variable0]
            ) [Primary2]
```

```
                ) [Factor3]
              ) [Term1]
            ) [Aritexp1]
          ) [Relexp0]
        ) [Andexp1]
      ) [Expression1]
      THEN
      Statements(
        Statements_list0(
          Statements_list1(
            Statement4(
              Readio_statement(
                Expression1(
                  Andexp1(
                    Relexp1(
                      Aritexp1(
                        Term1(
                          Factor3(
                            Primary2(
                              Variable0(
                                a
                              ) [Variable0]
                            ) [Primary2]
                          ) [Factor3]
                        ) [Term1]
                      ) [Aritexp1]
                    ) [Relexp1]
                  ) [Andexp1]
                ) [Expression1]
              ) [Readio_statement]
            ) [Statement4]
          ) [Statements_list1]
          Statement1(
            Conditional1(
            ) [Conditional1]
          ) [Statement1]
        ) [Statements_list0]
      ) [Statements]
    ) [Conditional_list0]
    Conditional_op1(
    ) [Conditional_op1]
  ) [Conditional0]
) [Statement1]
) [Statements_list0]
) [Statements]
Teste
```

) [Module]

---

Arquivo de saída .sintatico:

---

```
const_opt ::=  -- Linha do lookahead:38
vardecl ::= VAR -- Linha do lookahead:6
idlist_list ::= ID -- Linha do lookahead:8
idlist_list ::= idlist_list VIRGULA ID -- Linha do lookahead:7
vartype ::= INTEGER -- Linha do lookahead:10
vardecl ::= vardecl idlist PONTOPONTO vartype PONTOVIRGULA  -- Linha do lookahead:4
var_opt ::= vardecl -- Linha do lookahead:39
decl_list ::= const_opt var_opt -- Linha do lookahead:36
formalpars_op ::=  -- Linha do lookahead:25
formalpars ::= OPAR formalpars_op CPAR -- Linha do lookahead:23
vartype ::= INTEGER -- Linha do lookahead:10
procheader_op ::= PONTOPONTO vartype -- Linha do lookahead:20
procheader ::= PROCEDURE ID formalpars procheader_op -- Linha do lookahead:19
const_opt ::=  -- Linha do lookahead:38
var_opt ::=  -- Linha do lookahead:40
decl_list ::= const_opt var_opt -- Linha do lookahead:36
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
```

expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= aritexp ADDOP term -- Linha do lookahead:47
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression  -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
repetition ::= WHILE expression DO statements END  -- Linha do lookahead:80
statement ::= repetition -- Linha do lookahead:70
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
procbody ::= declarations BEGIN statements END ID -- Linha do lookahead:22
procdecl_op ::= procbody  -- Linha do lookahead:17
procdecl ::= procheader PONTOVIRGULA procdecl_op -- Linha do lookahead:16
decl_list ::=  decl_list procdecl PONTOVIRGULA  -- Linha do lookahead:35
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression  -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48

variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= aritexp ADDOP term -- Linha do lookahead:47
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  WRITELN -- Linha do lookahead:83
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
conditional_list ::= IF expression THEN statements -- Linha do lookahead:77
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44

```
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  READ OPAR expression CPAR -- Linha do lookahead:85
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
conditional ::=  -- Linha do lookahead:75
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
conditional_list ::= conditional_list ELSIF expression THEN statements -- Linha do lookahead:76
conditional_op ::=  -- Linha do lookahead:79
conditional ::= conditional_list conditional_op END -- Linha do lookahead:74
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
module ::= MODULE ID PONTOVIRGULA declarations BEGIN statements END ID PONTO --
Linha do lookahead:1
```

---

## Teste 2

Arquivo de entrada:

---

```
module Sample; // Cabeçalho do módulo

var vec : array 10 of integer;

procedure max(var v : array of integer) : integer;
   var i, m : Integer;
   begin i := 1; m := v[0];
        while i < v.size do
            if m < v[i] then m := v[i] end
        end;
        result := m
          end max;

procedure read_vec(var v : array of integer);
   var i : Integer;
```

```
    begin i := 0;
        while i < v.size do
            read(v[i])
        end
    end read_vec;

procedure print_vec(var v : array of integer);
    var i : Integer;
    begin i := 0;
        while i < v.size do
            writeln(v[i])
        end
    end print_vec;

begin read_vec(vec);
      print_vec(vec);
      writeln; writeln(max(vec));
end Sample.
```

Arquivo de saída .ast:

```
Module(
  Sample
  Declarations(
    Decl_list0(
      Decl_list0(
        Decl_list0(
          Decl_list1(
            Const_opt1(
            ) [Const_opt1]
            Var_opt0(
              Vardecl(
                null
                Idlist1(
                  vec
                ) [Idlist1]
                Vartype(
                  Arraytype(
                    Arraytype_op0(
                      Expression1(
                        Andexp1(
                          Relexp1(
                            Aritexp1(
                              Term1(
                                Factor3(
```

```
                    Primary1(
                      Literal0(
                        10
                      ) [Literal0]
                    ) [Primary1]
                  ) [Factor3]
                ) [Term1]
              ) [Aritexp1]
            ) [Relexp1]
          ) [Andexp1]
        ) [Expression1]
      ) [Arraytype_op0]
      null
    ) [Arraytype]
  ) [Vartype]
 ) [Vardecl]
) [Var_opt0]
) [Decl_list1]
Procdecl(
 Procheader(
  Formalpars(
   Formalpars_op0(
    Formalpars_list1(
     Fpsection(
      Idlist1(
       v
      ) [Idlist1]
      Vartype(
       Arraytype(
        Arraytype_op1(
        ) [Arraytype_op1]
        null
       ) [Arraytype]
      ) [Vartype]
     ) [Fpsection]
    ) [Formalpars_list1]
   ) [Formalpars_op0]
  ) [Formalpars]
  Procheader_op0(
   null
  ) [Procheader_op0]
 ) [Procheader]
 Procdecl_op0(
  Procbody(
   Declarations(
    Decl_list1(
```

```
    Const_opt1(
    ) [Const_opt1]
    Var_opt0(
      Vardecl(
        null
        Idlist0(
          Idlist1(
            i
          ) [Idlist1]
          m
        ) [Idlist0]
        null
      ) [Vardecl]
    ) [Var_opt0]
  ) [Decl_list1]
) [Declarations]
Statements(
  Statements_list0(
    Statements_list0(
      Statements_list0(
        Statements_list1(
          Statement0(
            Assignment(
              Variable0(
                i
              ) [Variable0]
              Expression1(
                Andexp1(
                  Relexp1(
                    Aritexp1(
                      Term1(
                        Factor3(
                          Primary1(
                            Literal0(
                              1
                            ) [Literal0]
                          ) [Primary1]
                        ) [Factor3]
                      ) [Term1]
                    ) [Aritexp1]
                  ) [Relexp1]
                ) [Andexp1]
              ) [Expression1]
            ) [Assignment]
          ) [Statement0]
        ) [Statements_list1]
```

```
Statement0(
  Assignment(
    Variable0(
      m
    ) [Variable0]
    Expression1(
      Andexp1(
        Relexp1(
          Aritexp1(
            Term1(
              Factor3(
                Primary2(
                  Variable1(
                    v
                    Expression1(
                      Andexp1(
                        Relexp1(
                          Aritexp1(
                            Term1(
                              Factor3(
                                Primary1(
                                  Literal0(
                                    0
                                  ) [Literal0]
                                ) [Primary1]
                              ) [Factor3]
                            ) [Term1]
                          ) [Aritexp1]
                        ) [Relexp1]
                      ) [Andexp1]
                    ) [Expression1]
                  ) [Variable1]
                ) [Primary2]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp1]
        ) [Relexp1]
      ) [Andexp1]
    ) [Expression1]
  ) [Assignment]
) [Statement0]
) [Statements_list0]
Statement2(
  Repetition0(
    WHILE
    Expression1(
```

```
  Andexp1(
    Relexp0(
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable0(
                i
              ) [Variable0]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
      <
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable2(
                v
                PONTO
                SIZE -- Linha do lookahead:67

              ) [Variable2]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
    ) [Relexp0]
  ) [Andexp1]
) [Expression1]
DO
Statements(
  Statements_list1(
    Statement1(
      Conditional0(
        Conditional_list1(
          IF
          Expression1(
            Andexp1(
              Relexp0(
                Aritexp1(
                  Term1(
                    Factor3(
                      Primary2(
                        Variable0(
```

```
                m
              ) [Variable0]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
      <
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable1(
                v
                Expression1(
                  Andexp1(
                    Relexp1(
                      Aritexp1(
                        Term1(
                          Factor3(
                            Primary2(
                              Variable0(
                                i
                              ) [Variable0]
                            ) [Primary2]
                          ) [Factor3]
                        ) [Term1]
                      ) [Aritexp1]
                    ) [Relexp1]
                  ) [Andexp1]
                ) [Expression1]
              ) [Variable1]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
    ) [Relexp0]
  ) [Andexp1]
) [Expression1]
THEN
Statements(
  Statements_list1(
    Statement0(
      Assignment(
        Variable0(
          m
        ) [Variable0]
```

```
Expression1(
 Andexp1(
  Relexp1(
   Aritexp1(
    Term1(
     Factor3(
      Primary2(
       Variable1(
        v
        Expression1(
         Andexp1(
          Relexp1(
           Aritexp1(
            Term1(
             Factor3(
              Primary2(
               Variable0(
                i
               ) [Variable0]
              ) [Primary2]
             ) [Factor3]
            ) [Term1]
           ) [Aritexp1]
          ) [Relexp1]
         ) [Andexp1]
        ) [Expression1]
       ) [Variable1]
      ) [Primary2]
     ) [Factor3]
    ) [Term1]
   ) [Aritexp1]
  ) [Relexp1]
 ) [Andexp1]
) [Expression1]
) [Assignment]
) [Statement0]
) [Statements_list1]
) [Statements]
) [Conditional_list1]
Conditional_op1(
) [Conditional_op1]
) [Conditional0]
) [Statement1]
) [Statements_list1]
) [Statements]
) [Repetition0]
```

```
            ) [Statement2]
          ) [Statements_list0]
          Statement0(
            Assignment(
              Variable0(
                result
              ) [Variable0]
              Expression1(
                Andexp1(
                  Relexp1(
                    Aritexp1(
                      Term1(
                        Factor3(
                          Primary2(
                            Variable0(
                              m
                            ) [Variable0]
                          ) [Primary2]
                        ) [Factor3]
                      ) [Term1]
                    ) [Aritexp1]
                  ) [Relexp1]
                ) [Andexp1]
              ) [Expression1]
            ) [Assignment]
          ) [Statement0]
        ) [Statements_list0]
      ) [Statements]
      max
    ) [Procbody]
  ) [Procdecl_op0]
 ) [Procdecl]
) [Decl_list0]
Procdecl(
 Procheader(
  Formalpars(
   Formalpars_op0(
    Formalpars_list1(
     Fpsection(
      Idlist1(
       v
      ) [Idlist1]
      Vartype(
       Arraytype(
        Arraytype_op1(
        ) [Arraytype_op1]
```

```
            null
          ) [Arraytype]
        ) [Vartype]
      ) [Fpsection]
    ) [Formalpars_list1]
  ) [Formalpars_op0]
 ) [Formalpars]
 Procheader_op1(
 ) [Procheader_op1]
) [Procheader]
Procdecl_op0(
 Procbody(
  Declarations(
   Decl_list1(
    Const_opt1(
    ) [Const_opt1]
    Var_opt0(
     Vardecl(
      null
      Idlist1(
       i
      ) [Idlist1]
      null
     ) [Vardecl]
    ) [Var_opt0]
   ) [Decl_list1]
  ) [Declarations]
  Statements(
   Statements_list0(
    Statements_list1(
     Statement0(
      Assignment(
       Variable0(
        i
       ) [Variable0]
       Expression1(
        Andexp1(
         Relexp1(
          Aritexp1(
           Term1(
            Factor3(
             Primary1(
              Literal0(
               0
              ) [Literal0]
             ) [Primary1]
```

```
            ) [Factor3]
          ) [Term1]
        ) [Aritexp1]
      ) [Relexp1]
    ) [Andexp1]
  ) [Expression1]
 ) [Assignment]
) [Statement0]
) [Statements_list1]
Statement2(
 Repetition0(
  WHILE
  Expression1(
   Andexp1(
    Relexp0(
     Aritexp1(
      Term1(
       Factor3(
        Primary2(
         Variable0(
          i
         ) [Variable0]
        ) [Primary2]
       ) [Factor3]
      ) [Term1]
     ) [Aritexp1]
     <
     Aritexp1(
      Term1(
       Factor3(
        Primary2(
         Variable2(
          v
          PONTO
          SIZE -- Linha do lookahead:67

         ) [Variable2]
        ) [Primary2]
       ) [Factor3]
      ) [Term1]
     ) [Aritexp1]
    ) [Relexp0]
   ) [Andexp1]
  ) [Expression1]
  DO
  Statements(
```

```
          Statements_list1(
            Statement4(
              Readio_statement(
                Expression1(
                  Andexp1(
                    Relexp1(
                      Aritexp1(
                        Term1(
                          Factor3(
                            Primary2(
                              Variable1(
                                v
                                Expression1(
                                  Andexp1(
                                    Relexp1(
                                      Aritexp1(
                                        Term1(
                                          Factor3(
                                            Primary2(
                                              Variable0(
                                                i
                                              ) [Variable0]
                                            ) [Primary2]
                                          ) [Factor3]
                                        ) [Term1]
                                      ) [Aritexp1]
                                    ) [Relexp1]
                                  ) [Andexp1]
                                ) [Expression1]
                              ) [Variable1]
                            ) [Primary2]
                          ) [Factor3]
                        ) [Term1]
                      ) [Aritexp1]
                    ) [Relexp1]
                  ) [Andexp1]
                ) [Expression1]
              ) [Readio_statement]
            ) [Statement4]
          ) [Statements_list1]
        ) [Statements]
      ) [Repetition0]
    ) [Statement2]
  ) [Statements_list0]
) [Statements]
read_vec
```

```
      ) [Procbody]
    ) [Procdecl_op0]
  ) [Procdecl]
) [Decl_list0]
Procdecl(
  Procheader(
    Formalpars(
      Formalpars_op0(
        Formalpars_list1(
          Fpsection(
            Idlist1(
              v
            ) [Idlist1]
            Vartype(
              Arraytype(
                Arraytype_op1(
                ) [Arraytype_op1]
                null
              ) [Arraytype]
            ) [Vartype]
          ) [Fpsection]
        ) [Formalpars_list1]
      ) [Formalpars_op0]
    ) [Formalpars]
    Procheader_op1(
    ) [Procheader_op1]
  ) [Procheader]
  Procdecl_op0(
    Procbody(
      Declarations(
        Decl_list1(
          Const_opt1(
          ) [Const_opt1]
          Var_opt0(
            Vardecl(
              null
              Idlist1(
                i
              ) [Idlist1]
              null
            ) [Vardecl]
          ) [Var_opt0]
        ) [Decl_list1]
      ) [Declarations]
      Statements(
        Statements_list0(
```

```
Statements_list1(
  Statement0(
    Assignment(
      Variable0(
        i
      ) [Variable0]
      Expression1(
        Andexp1(
          Relexp1(
            Aritexp1(
              Term1(
                Factor3(
                  Primary1(
                    Literal0(
                      0
                    ) [Literal0]
                  ) [Primary1]
                ) [Factor3]
              ) [Term1]
            ) [Aritexp1]
          ) [Relexp1]
        ) [Andexp1]
      ) [Expression1]
    ) [Assignment]
  ) [Statement0]
) [Statements_list1]
Statement2(
  Repetition0(
    WHILE
    Expression1(
      Andexp1(
        Relexp0(
          Aritexp1(
            Term1(
              Factor3(
                Primary2(
                  Variable0(
                    i
                  ) [Variable0]
                ) [Primary2]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp1]
          <
          Aritexp1(
            Term1(
```

```
          Factor3(
            Primary2(
              Variable2(
                v
                PONTO
                SIZE -- Linha do lookahead:67

              ) [Variable2]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
    ) [Relexp0]
  ) [Andexp1]
) [Expression1]
DO
Statements(
  Statements_list1(
    Statement4(
      Io_statement1(
        Expression1(
          Andexp1(
            Relexp1(
              Aritexp1(
                Term1(
                  Factor3(
                    Primary2(
                      Variable1(
                        v
                        Expression1(
                          Andexp1(
                            Relexp1(
                              Aritexp1(
                                Term1(
                                  Factor3(
                                    Primary2(
                                      Variable0(
                                        i
                                      ) [Variable0]
                                    ) [Primary2]
                                  ) [Factor3]
                                ) [Term1]
                              ) [Aritexp1]
                            ) [Relexp1]
                          ) [Andexp1]
                        ) [Expression1]
```

```
                                    ) [Variable1]
                                  ) [Primary2]
                                ) [Factor3]
                              ) [Term1]
                            ) [Aritexp1]
                          ) [Relexp1]
                        ) [Andexp1]
                      ) [Expression1]
                    ) [Io_statement1]
                  ) [Statement4]
                ) [Statements_list1]
              ) [Statements]
            ) [Repetition0]
          ) [Statement2]
        ) [Statements_list0]
      ) [Statements]
      print_vec
    ) [Procbody]
  ) [Procdecl_op0]
 ) [Procdecl]
) [Decl_list0]
) [Declarations]
Statements(
 Statements_list0(
  Statements_list0(
   Statements_list0(
    Statements_list0(
     Statements_list1(
      Statement3(
       Proccall(
        read_vec
        Actualpar(
         Actualpar_op0(
          Actualpar_list1(
           Expression1(
            Andexp1(
             Relexp1(
              Aritexp1(
               Term1(
                Factor3(
                 Primary2(
                  Variable0(
                   vec
                  ) [Variable0]
                 ) [Primary2]
                ) [Factor3]
```

```
                    ) [Term1]
                  ) [Aritexp1]
                ) [Relexp1]
              ) [Andexp1]
            ) [Expression1]
          ) [Actualpar_list1]
        ) [Actualpar_op0]
      ) [Actualpar]
    ) [Proccall]
  ) [Statement3]
) [Statements_list1]
Statement3(
  Proccall(
    print_vec
    Actualpar(
      Actualpar_op0(
        Actualpar_list1(
          Expression1(
            Andexp1(
              Relexp1(
                Aritexp1(
                  Term1(
                    Factor3(
                      Primary2(
                        Variable0(
                          vec
                        ) [Variable0]
                      ) [Primary2]
                    ) [Factor3]
                  ) [Term1]
                ) [Aritexp1]
              ) [Relexp1]
            ) [Andexp1]
          ) [Expression1]
        ) [Actualpar_list1]
      ) [Actualpar_op0]
    ) [Actualpar]
  ) [Proccall]
) [Statement3]
) [Statements_list0]
Statement4(
  NOVALINHAio_statement(
  ) [NOVALINHAio_statement]
) [Statement4]
) [Statements_list0]
Statement4(
```

```
    Io_statement1(
     Expression1(
      Andexp1(
       Relexp1(
        Aritexp1(
         Term1(
          Factor3(
           Primary3(
            Proccall(
             max
             Actualpar(
              Actualpar_op0(
               Actualpar_list1(
                Expression1(
                 Andexp1(
                  Relexp1(
                   Aritexp1(
                    Term1(
                     Factor3(
                      Primary2(
                       Variable0(
                        vec
                       ) [Variable0]
                      ) [Primary2]
                     ) [Factor3]
                    ) [Term1]
                   ) [Aritexp1]
                  ) [Relexp1]
                 ) [Andexp1]
                ) [Expression1]
               ) [Actualpar_list1]
              ) [Actualpar_op0]
             ) [Actualpar]
            ) [Proccall]
           ) [Primary3]
          ) [Factor3]
         ) [Term1]
        ) [Aritexp1]
       ) [Relexp1]
      ) [Andexp1]
     ) [Expression1]
    ) [Io_statement1]
   ) [Statement4]
  ) [Statements_list0]
  Statement1(
   Conditional1(
```

```
        ) [Conditional1]
      ) [Statement1]
    ) [Statements_list0]
  ) [Statements]
  Sample
) [Module]
```

---

Arquivo de saída .sintatico:

---

```
const_opt ::=  -- Linha do lookahead:38
vardecl ::= VAR -- Linha do lookahead:6
idlist_list ::= ID -- Linha do lookahead:8
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
arraytype_op ::= expression -- Linha do lookahead:14
vartype ::= INTEGER -- Linha do lookahead:10
arraytype ::= ARRAY arraytype_op OF vartype -- Linha do lookahead:13
vartype ::= arraytype -- Linha do lookahead:12
vardecl ::= vardecl idlist PONTOPONTO vartype PONTOVIRGULA  -- Linha do lookahead:4
var_opt ::= vardecl -- Linha do lookahead:39
decl_list ::= const_opt var_opt -- Linha do lookahead:36
fpsection_op ::= VAR -- Linha do lookahead:29
idlist_list ::= ID -- Linha do lookahead:8
arraytype_op ::=  -- Linha do lookahead:15
vartype ::= INTEGER -- Linha do lookahead:10
arraytype ::= ARRAY arraytype_op OF vartype -- Linha do lookahead:13
vartype ::= arraytype -- Linha do lookahead:12
fpsection ::= fpsection_op idlist PONTOPONTO vartype -- Linha do lookahead:28
formalpars_list ::= fpsection -- Linha do lookahead:27
formalpars_op ::= formalpars_list -- Linha do lookahead:24
formalpars ::= OPAR formalpars_op CPAR -- Linha do lookahead:23
vartype ::= INTEGER -- Linha do lookahead:10
procheader_op ::= PONTOPONTO vartype -- Linha do lookahead:20
procheader ::= PROCEDURE ID formalpars procheader_op -- Linha do lookahead:19
const_opt ::=  -- Linha do lookahead:38
vardecl ::= VAR -- Linha do lookahead:6
idlist_list ::= ID -- Linha do lookahead:8
idlist_list ::= idlist_list VIRGULA ID -- Linha do lookahead:7
```

vartype ::= INTEGER -- Linha do lookahead:10
vardecl ::= vardecl idlist PONTOPONTO vartype PONTOVIRGULA  -- Linha do lookahead:4
var_opt ::= vardecl -- Linha do lookahead:39
decl_list ::= const_opt var_opt -- Linha do lookahead:36
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
ID OOPAR expression OCPAR -- Linha do lookahead:66
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID PONTO SIZE -- Linha do lookahead:67
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50

aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
ID OOPAR expression OCPAR -- Linha do lookahead:66
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
ID OOPAR expression OCPAR -- Linha do lookahead:66
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31

conditional_list ::= IF expression THEN statements -- Linha do lookahead:77
conditional_op ::=  -- Linha do lookahead:79
conditional ::= conditional_list conditional_op END -- Linha do lookahead:74
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
repetition ::= WHILE expression DO statements END  -- Linha do lookahead:80
statement ::= repetition -- Linha do lookahead:70
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
procbody ::= declarations BEGIN statements END ID -- Linha do lookahead:22
procdecl_op ::= procbody  -- Linha do lookahead:17
procdecl ::= procheader PONTOVIRGULA procdecl_op -- Linha do lookahead:16
decl_list ::=  decl_list procdecl PONTOVIRGULA  -- Linha do lookahead:35
fpsection_op ::= VAR -- Linha do lookahead:29
idlist_list ::= ID -- Linha do lookahead:8
arraytype_op ::=  -- Linha do lookahead:15
vartype ::= INTEGER -- Linha do lookahead:10
arraytype ::= ARRAY arraytype_op OF vartype -- Linha do lookahead:13
vartype ::= arraytype -- Linha do lookahead:12
fpsection ::= fpsection_op idlist PONTOPONTO vartype -- Linha do lookahead:28
formalpars_list ::= fpsection -- Linha do lookahead:27
formalpars_op ::= formalpars_list -- Linha do lookahead:24
formalpars ::= OPAR formalpars_op CPAR -- Linha do lookahead:23
procheader_op ::=  -- Linha do lookahead:21
procheader ::= PROCEDURE ID formalpars procheader_op -- Linha do lookahead:19
const_opt ::=  -- Linha do lookahead:38
vardecl ::= VAR -- Linha do lookahead:6
idlist_list ::= ID -- Linha do lookahead:8
vartype ::= INTEGER -- Linha do lookahead:10
vardecl ::= vardecl idlist PONTOPONTO vartype PONTOVIRGULA  -- Linha do lookahead:4
var_opt ::= vardecl -- Linha do lookahead:39
decl_list ::= const_opt var_opt -- Linha do lookahead:36
declarations ::= decl_list -- Linha do lookahead:34

variable ::= ID -- Linha do lookahead:65
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression  -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID PONTO SIZE -- Linha do lookahead:67
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
ID OOPAR expression OCPAR -- Linha do lookahead:66
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  READ OPAR expression CPAR -- Linha do lookahead:85
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
repetition ::= WHILE expression DO statements END  -- Linha do lookahead:80

statement ::= repetition -- Linha do lookahead:70
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
procbody ::= declarations BEGIN statements END ID -- Linha do lookahead:22
procdecl_op ::= procbody  -- Linha do lookahead:17
procdecl ::= procheader PONTOVIRGULA procdecl_op -- Linha do lookahead:16
decl_list ::=  decl_list procdecl PONTOVIRGULA  -- Linha do lookahead:35
fpsection_op ::= VAR -- Linha do lookahead:29
idlist_list ::= ID -- Linha do lookahead:8
arraytype_op ::=  -- Linha do lookahead:15
vartype ::= INTEGER -- Linha do lookahead:10
arraytype ::= ARRAY arraytype_op OF vartype -- Linha do lookahead:13
vartype ::= arraytype -- Linha do lookahead:12
fpsection ::= fpsection_op idlist PONTOPONTO vartype -- Linha do lookahead:28
formalpars_list ::= fpsection -- Linha do lookahead:27
formalpars_op ::= formalpars_list -- Linha do lookahead:24
formalpars ::= OPAR formalpars_op CPAR -- Linha do lookahead:23
procheader_op ::=  -- Linha do lookahead:21
procheader ::= PROCEDURE ID formalpars procheader_op -- Linha do lookahead:19
const_opt ::=  -- Linha do lookahead:38
vardecl ::= VAR -- Linha do lookahead:6
idlist_list ::= ID -- Linha do lookahead:8
vartype ::= INTEGER -- Linha do lookahead:10
vardecl ::= vardecl idlist PONTOPONTO vartype PONTOVIRGULA  -- Linha do lookahead:4
var_opt ::= vardecl -- Linha do lookahead:39
decl_list ::= const_opt var_opt -- Linha do lookahead:36
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression  -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID PONTO SIZE -- Linha do lookahead:67
primary ::= variable -- Linha do lookahead:57

factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
ID OOPAR expression OCPAR -- Linha do lookahead:66
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  WRITELN OPAR expression CPAR -- Linha do lookahead:84
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
repetition ::= WHILE expression DO statements END  -- Linha do lookahead:80
statement ::= repetition -- Linha do lookahead:70
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
procbody ::= declarations BEGIN statements END ID -- Linha do lookahead:22
procdecl_op ::= procbody  -- Linha do lookahead:17
procdecl ::= procheader PONTOVIRGULA procdecl_op -- Linha do lookahead:16
decl_list ::=  decl_list procdecl PONTOVIRGULA  -- Linha do lookahead:35
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
actualpar_list ::= expression  -- Linha do lookahead:64
actualpar_op ::= actualpar_list -- Linha do lookahead:61
actualpar ::= OPAR actualpar_op CPAR -- Linha do lookahead:60

proccall ::= ID actualpar -- Linha do lookahead:59
statement ::= proccall -- Linha do lookahead:71
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
actualpar_list ::= expression  -- Linha do lookahead:64
actualpar_op ::= actualpar_list -- Linha do lookahead:61
actualpar ::= OPAR actualpar_op CPAR -- Linha do lookahead:60
proccall ::= ID actualpar -- Linha do lookahead:59
statement ::= proccall -- Linha do lookahead:71
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
io_statement ::=  WRITELN -- Linha do lookahead:83
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
actualpar_list ::= expression  -- Linha do lookahead:64
actualpar_op ::= actualpar_list -- Linha do lookahead:61
actualpar ::= OPAR actualpar_op CPAR -- Linha do lookahead:60
proccall ::= ID actualpar -- Linha do lookahead:59
primary ::= proccall -- Linha do lookahead:58
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  WRITELN OPAR expression CPAR -- Linha do lookahead:84
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
conditional ::=  -- Linha do lookahead:75
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31

module ::= MODULE ID PONTOVIRGULA declarations BEGIN statements END ID PONTO --
Linha do lookahead:1

---

## Teste 3

Arquivo de entrada:

---

```
module TesteErro //sem ponto e virgula
 var a : INTEGER;
 PROCEDURE proc () : INTEGER;
 begin
          b:=a;
          while b<5 do
                   b:=b+1
                   end
end proc;

begin
b:=a;
c:=a=b-1;
if b>c then writeln
elsif b>a then read(a);
end
end Teste.
```

---

Saída no console:

---

```
Syntax error at line 1, column 1
Recuperado Erro
```

---

Arquivo de saída .ast:

---

```
Module(
  TesteErro
  Declarations(
    Decl_list0(
      Decl_list1(
        Const_opt1(
        ) [Const_opt1]
        Var_opt0(
          Vardecl(
            null
            Idlist1(
```

```
        a
      ) [Idlist1]
      null
    ) [Vardecl]
  ) [Var_opt0]
) [Decl_list1]
Procdecl(
  Procheader(
    Formalpars(
      Formalpars_op1(
      ) [Formalpars_op1]
    ) [Formalpars]
    Procheader_op0(
      null
    ) [Procheader_op0]
  ) [Procheader]
  Procdecl_op0(
    Procbody(
      Declarations(
        Decl_list1(
          Const_opt1(
          ) [Const_opt1]
          Var_opt1(
          ) [Var_opt1]
        ) [Decl_list1]
      ) [Declarations]
      Statements(
        Statements_list0(
          Statements_list1(
            Statement0(
              Assignment(
                Variable0(
                  b
                ) [Variable0]
                Expression1(
                  Andexp1(
                    Relexp1(
                      Aritexp1(
                        Term1(
                          Factor3(
                            Primary2(
                              Variable0(
                                a
                              ) [Variable0]
                            ) [Primary2]
                          ) [Factor3]
```

```
            ) [Term1]
          ) [Aritexp1]
        ) [Relexp1]
      ) [Andexp1]
    ) [Expression1]
  ) [Assignment]
 ) [Statement0]
) [Statements_list1]
Statement2(
 Repetition0(
  WHILE
  Expression1(
   Andexp1(
    Relexp0(
     Aritexp1(
      Term1(
       Factor3(
        Primary2(
         Variable0(
          b
         ) [Variable0]
        ) [Primary2]
       ) [Factor3]
      ) [Term1]
     ) [Aritexp1]
     <
     Aritexp1(
      Term1(
       Factor3(
        Primary1(
         Literal0(
          5
         ) [Literal0]
        ) [Primary1]
       ) [Factor3]
      ) [Term1]
     ) [Aritexp1]
    ) [Relexp0]
   ) [Andexp1]
  ) [Expression1]
  DO
  Statements(
   Statements_list1(
    Statement0(
     Assignment(
      Variable0(
```

```
                b
              ) [Variable0]
              Expression1(
                Andexp1(
                  Relexp1(
                    Aritexp0(
                      Aritexp1(
                        Term1(
                          Factor3(
                            Primary2(
                              Variable0(
                                b
                              ) [Variable0]
                            ) [Primary2]
                          ) [Factor3]
                        ) [Term1]
                      ) [Aritexp1]
                      +
                      Term1(
                        Factor3(
                          Primary1(
                            Literal0(
                              1
                            ) [Literal0]
                          ) [Primary1]
                        ) [Factor3]
                      ) [Term1]
                    ) [Aritexp0]
                  ) [Relexp1]
                ) [Andexp1]
              ) [Expression1]
            ) [Assignment]
          ) [Statement0]
        ) [Statements_list1]
      ) [Statements]
    ) [Repetition0]
  ) [Statement2]
) [Statements_list0]
) [Statements]
proc
) [Procbody]
) [Procdecl_op0]
) [Procdecl]
) [Decl_list0]
) [Declarations]
Statements(
```

```
Statements_list0(
  Statements_list0(
    Statements_list1(
      Statement0(
        Assignment(
          Variable0(
            b
          ) [Variable0]
          Expression1(
            Andexp1(
              Relexp1(
                Aritexp1(
                  Term1(
                    Factor3(
                      Primary2(
                        Variable0(
                          a
                        ) [Variable0]
                      ) [Primary2]
                    ) [Factor3]
                  ) [Term1]
                ) [Aritexp1]
              ) [Relexp1]
            ) [Andexp1]
          ) [Expression1]
        ) [Assignment]
      ) [Statement0]
    ) [Statements_list1]
    Statement0(
      Assignment(
        Variable0(
          c
        ) [Variable0]
        Expression1(
          Andexp1(
            Relexp0(
              Aritexp1(
                Term1(
                  Factor3(
                    Primary2(
                      Variable0(
                        a
                      ) [Variable0]
                    ) [Primary2]
                  ) [Factor3]
                ) [Term1]
```

```
          ) [Aritexp1]
          =
          Aritexp0(
            Aritexp1(
              Term1(
                Factor3(
                  Primary2(
                    Variable0(
                      b
                    ) [Variable0]
                  ) [Primary2]
                ) [Factor3]
              ) [Term1]
            ) [Aritexp1]
            -
            Term1(
              Factor3(
                Primary1(
                  Literal0(
                    1
                  ) [Literal0]
                ) [Primary1]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp0]
        ) [Relexp0]
      ) [Andexp1]
    ) [Expression1]
  ) [Assignment]
 ) [Statement0]
) [Statements_list0]
Statement1(
 Conditional0(
  Conditional_list0(
   Conditional_list1(
    IF
    Expression1(
     Andexp1(
      Relexp0(
       Aritexp1(
        Term1(
         Factor3(
          Primary2(
           Variable0(
            b
           ) [Variable0]
```

```
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
      >
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable0(
                c
              ) [Variable0]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
    ) [Relexp0]
  ) [Andexp1]
) [Expression1]
THEN
Statements(
  Statements_list1(
    Statement4(
      NOVALINHAio_statement(
      ) [NOVALINHAio_statement]
    ) [Statement4]
  ) [Statements_list1]
) [Statements]
) [Conditional_list1]
ELSIF
Expression1(
  Andexp1(
    Relexp0(
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable0(
                b
              ) [Variable0]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
      >
      Aritexp1(
```

```
          Term1(
            Factor3(
              Primary2(
                Variable0(
                  a
                ) [Variable0]
              ) [Primary2]
            ) [Factor3]
          ) [Term1]
        ) [Aritexp1]
      ) [Relexp0]
    ) [Andexp1]
  ) [Expression1]
  THEN
  Statements(
    Statements_list0(
      Statements_list1(
        Statement4(
          Readio_statement(
            Expression1(
              Andexp1(
                Relexp1(
                  Aritexp1(
                    Term1(
                      Factor3(
                        Primary2(
                          Variable0(
                            a
                          ) [Variable0]
                        ) [Primary2]
                      ) [Factor3]
                    ) [Term1]
                  ) [Aritexp1]
                ) [Relexp1]
              ) [Andexp1]
            ) [Expression1]
          ) [Readio_statement]
        ) [Statement4]
      ) [Statements_list1]
      Statement1(
        Conditional1(
        ) [Conditional1]
      ) [Statement1]
    ) [Statements_list0]
  ) [Statements]
) [Conditional_list0]
```

```
        Conditional_op1(
        ) [Conditional_op1]
      ) [Conditional0]
    ) [Statement1]
  ) [Statements_list0]
 ) [Statements]
 Teste
) [Module]
```

---

Arquivo de saída .sintatico:

---

```
const_opt ::=  -- Linha do lookahead:38
vardecl ::= VAR -- Linha do lookahead:6
idlist_list ::= ID -- Linha do lookahead:8
vartype ::= INTEGER -- Linha do lookahead:10
vardecl ::= vardecl idlist PONTOPONTO vartype PONTOVIRGULA  -- Linha do lookahead:5
var_opt ::= vardecl -- Linha do lookahead:39
decl_list ::= const_opt var_opt -- Linha do lookahead:36
formalpars_op ::=  -- Linha do lookahead:25
formalpars ::= OPAR formalpars_op CPAR -- Linha do lookahead:23
vartype ::= INTEGER -- Linha do lookahead:10
procheader_op ::= PONTOPONTO vartype -- Linha do lookahead:20
procheader ::= PROCEDURE ID formalpars procheader_op -- Linha do lookahead:19
const_opt ::=  -- Linha do lookahead:38
var_opt ::=  -- Linha do lookahead:40
decl_list ::= const_opt var_opt -- Linha do lookahead:36
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
```

literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= aritexp ADDOP term -- Linha do lookahead:47
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
repetition ::= WHILE expression DO statements END  -- Linha do lookahead:80
statement ::= repetition -- Linha do lookahead:70
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
procbody ::= declarations BEGIN statements END ID -- Linha do lookahead:22
procdecl_op ::= procbody  -- Linha do lookahead:17
procdecl ::= procheader PONTOVIRGULA procdecl_op -- Linha do lookahead:16
decl_list ::=  decl_list procdecl PONTOVIRGULA  -- Linha do lookahead:35
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68

statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= aritexp ADDOP term -- Linha do lookahead:47
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  WRITELN -- Linha do lookahead:83
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
conditional_list ::= IF expression THEN statements -- Linha do lookahead:77
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48

variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  READ OPAR expression CPAR -- Linha do lookahead:85
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
conditional ::=  -- Linha do lookahead:75
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
conditional_list ::= conditional_list ELSIF expression THEN statements -- Linha do lookahead:76
conditional_op ::=  -- Linha do lookahead:79
conditional ::= conditional_list conditional_op END -- Linha do lookahead:74
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
module ::= MODULE ID PONTOVIRGULA declarations BEGIN statements END ID PONTO -- Linha do lookahead:2

---

### Teste 4

Arquivo de entrada:

---

```
module TesteErro;
 var a b, c : INTEGER; //sem virgula
 PROCEDURE proc () : INTEGER;
 begin
        b:=a;
        while b<5 do
                b:=b+1
                end
```

```
end proc;

begin
b:=a;
c:=a=b-1;
if b>c then writeln
elsif b>a then read(a);
end
end Teste.
```

---

Saída no Console:

---

```
Syntax error at line 1, column 7
Recuperado Erro
```

---

Arquivo de saída .ast:

---

```
Module(
  TesteErro
  Declarations(
    Decl_list0(
      Decl_list1(
        Const_opt1(
        ) [Const_opt1]
        Var_opt1(
        ) [Var_opt1]
      ) [Decl_list1]
      Procdecl(
        Procheader(
          Formalpars(
            Formalpars_op1(
            ) [Formalpars_op1]
          ) [Formalpars]
          Procheader_op0(
            null
          ) [Procheader_op0]
        ) [Procheader]
        Procdecl_op0(
          Procbody(
            Declarations(
              Decl_list1(
                Const_opt1(
```

```
    ) [Const_opt1]
    Var_opt1(
    ) [Var_opt1]
  ) [Decl_list1]
) [Declarations]
Statements(
  Statements_list0(
    Statements_list1(
      Statement0(
        Assignment(
          Variable0(
            b
          ) [Variable0]
          Expression1(
            Andexp1(
              Relexp1(
                Aritexp1(
                  Term1(
                    Factor3(
                      Primary2(
                        Variable0(
                          a
                        ) [Variable0]
                      ) [Primary2]
                    ) [Factor3]
                  ) [Term1]
                ) [Aritexp1]
              ) [Relexp1]
            ) [Andexp1]
          ) [Expression1]
        ) [Assignment]
      ) [Statement0]
    ) [Statements_list1]
    Statement2(
      Repetition0(
        WHILE
        Expression1(
          Andexp1(
            Relexp0(
              Aritexp1(
                Term1(
                  Factor3(
                    Primary2(
                      Variable0(
                        b
                      ) [Variable0]
```

```
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
      <
      Aritexp1(
        Term1(
          Factor3(
            Primary1(
              Literal0(
                5
              ) [Literal0]
            ) [Primary1]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
    ) [Relexp0]
  ) [Andexp1]
) [Expression1]
DO
Statements(
  Statements_list1(
    Statement0(
      Assignment(
        Variable0(
          b
        ) [Variable0]
        Expression1(
          Andexp1(
            Relexp1(
              Aritexp0(
                Aritexp1(
                  Term1(
                    Factor3(
                      Primary2(
                        Variable0(
                          b
                        ) [Variable0]
                      ) [Primary2]
                    ) [Factor3]
                  ) [Term1]
                ) [Aritexp1]
                +
                Term1(
                  Factor3(
                    Primary1(
```

```
                                    Literal0(
                                      1
                                    ) [Literal0]
                                  ) [Primary1]
                                ) [Factor3]
                              ) [Term1]
                            ) [Aritexp0]
                          ) [Relexp1]
                        ) [Andexp1]
                      ) [Expression1]
                    ) [Assignment]
                  ) [Statement0]
                ) [Statements_list1]
              ) [Statements]
            ) [Repetition0]
          ) [Statement2]
        ) [Statements_list0]
      ) [Statements]
      proc
    ) [Procbody]
  ) [Procdecl_op0]
 ) [Procdecl]
) [Decl_list0]
) [Declarations]
Statements(
 Statements_list0(
  Statements_list0(
   Statements_list1(
    Statement0(
     Assignment(
      Variable0(
       b
      ) [Variable0]
      Expression1(
       Andexp1(
        Relexp1(
         Aritexp1(
          Term1(
           Factor3(
            Primary2(
             Variable0(
              a
             ) [Variable0]
            ) [Primary2]
           ) [Factor3]
          ) [Term1]
```

```
          ) [Aritexp1]
        ) [Relexp1]
      ) [Andexp1]
    ) [Expression1]
  ) [Assignment]
 ) [Statement0]
) [Statements_list1]
Statement0(
 Assignment(
  Variable0(
   c
  ) [Variable0]
  Expression1(
   Andexp1(
    Relexp0(
     Aritexp1(
      Term1(
       Factor3(
        Primary2(
         Variable0(
          a
         ) [Variable0]
        ) [Primary2]
       ) [Factor3]
      ) [Term1]
     ) [Aritexp1]
     =
     Aritexp0(
      Aritexp1(
       Term1(
        Factor3(
         Primary2(
          Variable0(
           b
          ) [Variable0]
         ) [Primary2]
        ) [Factor3]
       ) [Term1]
      ) [Aritexp1]
      -
      Term1(
       Factor3(
        Primary1(
         Literal0(
          1
         ) [Literal0]
```

```
                ) [Primary1]
              ) [Factor3]
            ) [Term1]
          ) [Aritexp0]
        ) [Relexp0]
      ) [Andexp1]
    ) [Expression1]
  ) [Assignment]
) [Statement0]
) [Statements_list0]
Statement1(
  Conditional0(
    Conditional_list0(
      Conditional_list1(
        IF
        Expression1(
          Andexp1(
            Relexp0(
              Aritexp1(
                Term1(
                  Factor3(
                    Primary2(
                      Variable0(
                        b
                      ) [Variable0]
                    ) [Primary2]
                  ) [Factor3]
                ) [Term1]
              ) [Aritexp1]
              >
              Aritexp1(
                Term1(
                  Factor3(
                    Primary2(
                      Variable0(
                        c
                      ) [Variable0]
                    ) [Primary2]
                  ) [Factor3]
                ) [Term1]
              ) [Aritexp1]
            ) [Relexp0]
          ) [Andexp1]
        ) [Expression1]
        THEN
        Statements(
```

```
    Statements_list1(
      Statement4(
        NOVALINHAio_statement(
        ) [NOVALINHAio_statement]
      ) [Statement4]
    ) [Statements_list1]
  ) [Statements]
) [Conditional_list1]
ELSIF
Expression1(
  Andexp1(
    Relexp0(
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable0(
                b
              ) [Variable0]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
      >
      Aritexp1(
        Term1(
          Factor3(
            Primary2(
              Variable0(
                a
              ) [Variable0]
            ) [Primary2]
          ) [Factor3]
        ) [Term1]
      ) [Aritexp1]
    ) [Relexp0]
  ) [Andexp1]
) [Expression1]
THEN
Statements(
  Statements_list0(
    Statements_list1(
      Statement4(
        Readio_statement(
          Expression1(
            Andexp1(
```

```
                    Relexp1(
                      Aritexp1(
                        Term1(
                          Factor3(
                            Primary2(
                              Variable0(
                                a
                              ) [Variable0]
                            ) [Primary2]
                          ) [Factor3]
                        ) [Term1]
                      ) [Aritexp1]
                    ) [Relexp1]
                  ) [Andexp1]
                ) [Expression1]
              ) [Readio_statement]
            ) [Statement4]
          ) [Statements_list1]
          Statement1(
            Conditional1(
            ) [Conditional1]
          ) [Statement1]
        ) [Statements_list0]
      ) [Statements]
    ) [Conditional_list0]
    Conditional_op1(
    ) [Conditional_op1]
  ) [Conditional0]
 ) [Statement1]
) [Statements_list0]
) [Statements]
Teste
) [Module]
```

---

Arquivo de saída .sintatico:

---

```
const_opt ::=  -- Linha do lookahead:38
vardecl ::= VAR -- Linha do lookahead:6
const_opt ::=  -- Linha do lookahead:38
var_opt ::=  -- Linha do lookahead:40
decl_list ::= const_opt var_opt -- Linha do lookahead:36
formalpars_op ::=  -- Linha do lookahead:25
formalpars ::= OPAR formalpars_op CPAR -- Linha do lookahead:23
vartype ::= INTEGER -- Linha do lookahead:10
```

procheader_op ::= PONTOPONTO vartype -- Linha do lookahead:20
procheader ::= PROCEDURE ID formalpars procheader_op -- Linha do lookahead:19
const_opt ::=  -- Linha do lookahead:38
var_opt ::=  -- Linha do lookahead:40
decl_list ::= const_opt var_opt -- Linha do lookahead:36
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression  -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= aritexp ADDOP term -- Linha do lookahead:47
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression  -- Linha do lookahead:73

statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
repetition ::= WHILE expression DO statements END  -- Linha do lookahead:80
statement ::= repetition -- Linha do lookahead:70
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
procbody ::= declarations BEGIN statements END ID -- Linha do lookahead:22
procdecl_op ::= procbody  -- Linha do lookahead:17
procdecl ::= procheader PONTOVIRGULA procdecl_op -- Linha do lookahead:16
decl_list ::=  decl_list procdecl PONTOVIRGULA  -- Linha do lookahead:35
declarations ::= decl_list -- Linha do lookahead:34
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statement -- Linha do lookahead:33
variable ::= ID -- Linha do lookahead:65
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
literal ::=  NUMBER -- Linha do lookahead:86
primary ::= literal -- Linha do lookahead:56
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= aritexp ADDOP term -- Linha do lookahead:47
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
assignment ::= variable ATRI expression       -- Linha do lookahead:73
statement ::= assignment -- Linha do lookahead:68
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32

variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  WRITELN -- Linha do lookahead:83
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
statements ::= statements_list -- Linha do lookahead:31
conditional_list ::= IF expression THEN statements -- Linha do lookahead:77
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp RELOP aritexp -- Linha do lookahead:45
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
variable ::= ID -- Linha do lookahead:65
primary ::= variable -- Linha do lookahead:57
factor ::= primary -- Linha do lookahead:54
term ::= factor -- Linha do lookahead:50
aritexp ::= term -- Linha do lookahead:48
relexp ::= aritexp -- Linha do lookahead:46
andexp ::= relexp -- Linha do lookahead:44
expression ::= andexp -- Linha do lookahead:42
io_statement ::=  READ OPAR expression CPAR -- Linha do lookahead:85
statement ::= io_statement -- Linha do lookahead:72
statements_list ::= statement -- Linha do lookahead:33
conditional ::=  -- Linha do lookahead:75
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31

conditional_list ::= conditional_list ELSIF expression THEN statements -- Linha do lookahead:76
conditional_op ::=  -- Linha do lookahead:79
conditional ::= conditional_list conditional_op END -- Linha do lookahead:74
statement ::= conditional -- Linha do lookahead:69
statements_list ::= statements_list PONTOVIRGULA statement -- Linha do lookahead:32
statements ::= statements_list -- Linha do lookahead:31
module ::= MODULE ID PONTOVIRGULA declarations BEGIN statements END ID PONTO -- Linha do lookahead:2

---