CES41 - Compiladores **Análise Léxica da linguagem COMP-ITA 2019**

Laboratório 2 26 de Março de 2019

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Resultados Obtidos

O analisador léxico foi concluído com sucesso, a entrada usada como teste e a saída correspondente podem ser vistas no arquivo **teste.in** e **teste.out** respectivamente.

A entrada utilizada para teste foi:

call char do else false float for functions global if int local logic main program read return statements true void while write

a b c d e f g h i j k l m n o p q r s t u v w x y z A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 0 1 2 3 4 5 6 7 9 'a' 1.2 1.23 1.2e3 1.2e+3 1.2e-3 1.2E3 1.2E+3 1.2E-3

```
||
&&
< <= > >= = !=
+ -
* / %
program AnaliseDeTexto {
global:
      char nomes[50,10], palavra[10];
      int ntab, nocorr[50];
  char c; logic fim;
functions:
  int Procura () {
  local:
     int i, inf, sup, med, posic, compara;
      logic achou, fimteste;
  statements:
        achou <- false; inf <- 1; sup <- ntab;
        while (!achou && sup >= inf) {
              med <- (inf + sup) / 2;
              compara <- 0; fimteste <- false;
              for (i <- 0; !fimteste && compara = 0; i <- i+1) {
          if (palavra[i] < nomes[med,i])</pre>
              compara <- \sim 1;
            else if (palavra[i] > nomes[med,i])
              compara <- 1;
            if (palavra[i] = '\0' || nomes[med,i] = '\0')
              fimteste <- true;
              }
              if (compara = 0)
                    achou <- true;
```

```
else if (compara < 0)
                   \sup <- \text{med} - 1;
             else inf <- med + 1;
      if (achou) posic <- med;
      else posic <- ~inf;
      return posic;
}
void Inserir (int posic) {
local:
  int i, j; logic fim;
statements:
  ntab <- ntab + 1;
  for (i <- ntab; i >= posic+1; i <- i-1) {
     fim <- false;
     for (j <- 0; !fim; j <- j+1) {
        nomes[i,j] \leftarrow nomes[i-1,j];
        if (nomes[i,j] = '\0') fim <- true;
  nocorr[i] <- nocorr[i-1];
     fim <- false;
     for (j <- 0; !fim; j <- j+1) {
        nomes[posic,j] <- palavra[j];</pre>
        if (palavra[j] = '\0') fim <- true;
  nocorr[posic] <- 1;</pre>
void ExibirTabela () {
local:
  int i; logic fim;
statements:
  write ("
        "Palavra
        " Num. de ocorr.");
  for (i <-1; i <= 50; i <-i+1) write ("-");
  for (i <-1; i <= ntab; i <-i+1) {
     write ("\n
                       "); fim <- false;
     for (j <- 0; !fim; j <- j+1) {
        if (nomes[i,j] = '\0') fim <- true;
        else write (nomes[i,j]);
     write (" | ", nocorr[i]);
```

```
}
  main {
  local:
     int i, posic;
        char c; logic fim;
  statements:
     ntab <- 0;
     write ("Nova palavra? (s/n): ");
     read (c);
     while (c = 's' || c = 'S') {
          write ("\nDigite a palavra: ");
           fim <- false;
        for (i <- 0; !fim; i <- i+1) {
             read (palavra[i]);
             if (palavra[i] = '\n') {
                fim <- true;
                palavra[i] <- '\0';
             }
        posic <- Procura ();</pre>
        if (posic > 0)
           nocorr[posic] <- nocorr[posic] + 1;</pre>
        else
           call Inserir (~posic, i);
          write ("\n\nNova palavra? (s/n): ");
           read (c);
     }
     call ExibirTabela ();
  }
}
```

E a saída gerada foi:

Tex	to Tipo	o Atributo	
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floa	at FLOA	T XXXXXX	XXX
fc		XXXXXXX	\mathbf{X}
funct	ions FUNC	CTIONS XX	XXXXXXX

global	GLOBAL	XXXXXXX
if	IF	XXXXXXXX
	INT	XXXXXXXX
		XXXXXXXXX
	LOGIC	XXXXXXXX
logic		XXXXXXXX
	MAIN	
program	PROGRAM READ	XXXXXXXX XXXXXXXX
ototomontol	RETURN	XXXXXXXX XXXXXXXX
	STATEMENTS	XXXXXXXX
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void		XXXXXXXX XXXXXXXX
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w	ID	W
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          CLBRAK |
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          SCOLON |
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      :|
   program
             PROGRAM |
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AnaliseDeTexto
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  functions | FUNCTIONS |
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     int
```

Procura ID	Procura
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) CLPAR	XXXXXXXX
{ OPBRACE	XXXXXXXX
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: COLON	XXXXXXXX
int INT	XXXXXXXX
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inf ID	inf
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, COMMA sup ID , COMMA med ID	sup
	XXXXXXXX
medl ID I	med
	XXXXXXXX
, COMMA posic ID	posic
, COMMA	XXXXXXXX
compara ID	compara
; SCOLON	XXXXXXXX
logic LOGIC	XXXXXXXX
achou ID	achou
, COMMA	XXXXXXXX
fimteste ID	fimteste
; SCOLON	XXXXXXXX
statements STATEMENTS	XXXXXXXX
	^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^
: COLON	XXXXXXXX
: COLON achou ID	XXXXXXXX achou
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: COLON achou ID <- ASSIGN false FALSE	XXXXXXXX achou XXXXXXXX XXXXXXXX
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 void| VOID |
Inserir| ID |
          VOID |
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        OPPAR |
                         XXXXXXXX
    (|
          INT |
                         XXXXXXX
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        OPBRACE |
    \{|
                           XXXXXXXX
  local| LOCAL |
    :|
        COLON |
        INT |
   int
    i
         ID |
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        COMMA |
                           XXXXXXXX
    jl
         ID |
    ;|
        SCOLON |
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  logic LOGIC |
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    ;|
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statements | STATEMENTS |
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     SCOLON |
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for
       FOR |
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      OPPAR |
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      ID |
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    ASSIGN |
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     INTCT |
 ;
                       XXXXXXXX
     SCOLON |
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fim|
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     SCOLON |
                       XXXXXXXX
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      ID |
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      ASSIGN |
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1
      ADOP |
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     CLPAR |
                      XXXXXXXX
     OPBRACE |
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nomes| ID |
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 i|
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 i|
       ID |
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                        XXXXXXX
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     ID |
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     CLBRAK |
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     RELOP |
                      ŁQ
\0
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     CHARCT |
                      XXXXXXX
 )|
      CLPAR |
        ID |
                        fim
fim|
```

```
<-| ASSIGN |
                         XXXXXXXX
        TRUE |
                         XXXXXXXX
 true
      SCOLON |
  ;
                         XXXXXXXX
   }|
      CLBRACE |
                         XXXXXXXX
nocorr
         ID |
                         nocorr
      OPBRAK |
                         XXXXXXX
  i|
       ID |
                         i
   ][
      CLBRAK |
                         XXXXXXXX
  <-| ASSIGN |
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nocorr| ID |
                         nocorr
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      CLBRAK |
   ;|
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   }|
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 fim|
         ID |
                         fim
  <-|
       ASSIGN |
                         XXXXXXXX
 false|
       FALSE |
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  ;|
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                       XXXXXXXX
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      SCOLON |
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        NOT |
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        ID |
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  ;|
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  jl
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       INTCT |
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   )[
       CLPAR |
   \{|
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 nomes
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  ,
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       ID |
                         j
   ][
      CLBRAK |
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  <-| ASSIGN |
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palavra| ID |
                         palavra
  OPBRAK |
                         XXXXXXXX
  j|
        ID |
   ][
      CLBRAK |
                         XXXXXXXX
```

```
SCOLON |
                                XXXXXXXX
          if|
                            XXXXXXXX
              IF |
              OPPAR |
                               XXXXXXXX
          palavra
       palavra| ID |
          OPBRAK |
                                XXXXXXXX
          jΙ
               ID |
                                XXXXXXXX
          ][
              CLBRAK |
            RELOP |
                                  ΕQ
          =|
         '\0'|
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                               XXXXXXXX
          )|
              CLPAR |
                                fim
         fim|
                ID |
          <-|
              ASSIGN |
                                XXXXXXXX
         true
             TRUE |
                                XXXXXXXX
             SCOLON |
          ;|
                                XXXXXXXX
             CLBRACE |
                                XXXXXXXX
          }|
        nocorr ID |
                                nocorr
              OPBRAK |
          XXXXXXXX
        posic|
                 ID |
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          ]| CLBRAK |
                                XXXXXXXX
                                XXXXXXXX
          <-|
            ASSIGN |
          1|
                                1
              INTCT |
                              XXXXXXXX
          ;|
             SCOLON |
             CLBRACE |
                                XXXXXXXX
          }|
                               XXXXXXXX
        void|
                VOID |
     ExibirTabela| ID |
                              ExibirTabela
                            XXXXXXXX
XXXXXXXX
              OPPAR |
          (|
          )|
              CLPAR |
          \{|
            OPBRACE |
                              XXXXXXXX
        local LOCAL |
                                XXXXXXXX
              COLON |
                               XXXXXXXX
          :|
              INT |
         int
                              XXXXXXXX
          i
               ID |
                                i
          ;|
              SCOLON |
                                XXXXXXX
        logic
               LOGIC |
                                XXXXXXXX
         fim
               ID |
                                fim
                                XXXXXXXX
              SCOLON |
     statements | STATEMENTS |
                                      XXXXXXXX
              COLON |
                               XXXXXXX
          :|
        write| WRITE |
                               XXXXXXXX
                              XXXXXXXX
              OPPAR |
              STRING |
                OMMA | XXX
STRING | "Palavra
             COMMA |
                                XXXXXXXX
"Palavra
                       ING | " Num. de ocorr."
XXXXXXVV
          , COMMA |
 " Num. de ocorr."| STRING |
             CLPAR |
          )|
             SCOLON |
                               XXXXXXXX
          ;|
                               XXXXXXXX
         for
```

```
(|
           OPPAR |
                            XXXXXXXX
      il
           ID |
                             i
           ASSIGN |
                              XXXXXXXX
      <-|
      1|
          INTCT |
                              1
          SCOLON |
                             XXXXXXXX
      i
            ID |
      <=|
            RELOP |
                                LEQ
      50|
           INTCT |
                                50
      ;|
          SCOLON |
                             XXXXXXX
      i|
           ID |
                             i
      <-|
           ASSIGN |
                             XXXXXXXX
      i|
            ID |
                               PLUS
      +1
            ADOP |
      1|
           INTCT |
                               1
                            XXXXXXXX
      )|
           CLPAR |
    write|
           WRITE |
                             XXXXXXXX
           OPPAR |
                            XXXXXXXX
                            "_"
          STRING |
      )|
                            XXXXXXXX
          CLPAR |
      ;|
          SCOLON |
                            XXXXXXXX
     for|
            FOR |
                            XXXXXXXX
      (|
           OPPAR |
                            XXXXXXXX
      i
           ID |
                             XXXXXXX
      <-|
           ASSIGN |
      1|
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          INTCT |
      ;[
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          SCOLON |
      i|
            ID |
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     ntab|
            ID |
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          SCOLON |
      ;|
                             XXXXXXXX
      i|
            ID |
      <-|
           ASSIGN |
                             XXXXXXXX
      i
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                               PLUS
      +|
            ADOP |
      11
           INTCT |
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                            XXXXXXXX
      )[
           CLPAR |
      \{|
          OPBRACE |
                           XXXXXXXX
                              XXXXXXXX
    write
           WRITE |
           OPPAR |
                           XXXXXXXX
      (|
"\n
                           "\n "
           STRING |
                            XXXXXXXX
      )|
           CLPAR |
      ;|
          SCOLON |
                             XXXXXXX
     fim|
             ID |
                             fim
                           XXXXXXXX
XXXXXXXX
                             XXXXXXXX
      <-|
           ASSIGN |
    false
           FALSE |
      ;
          SCOLON |
                            XXXXXXXX
                            XXXXXXXX
     for
            FOR |
      (|
           OPPAR |
                            XXXXXXXX
```

```
ID |
  j
       ASSIGN |
                         XXXXXXX
  <-|
  0
                            0
       INTCT |
  ;|
                         XXXXXXXX
      SCOLON |
  !|
       NOT |
                       XXXXXXXX
 fim|
       ID |
                         fim
  ;|
      SCOLON |
                         XXXXXXX
  jΙ
       ID |
       ASSIGN |
                         XXXXXXXX
  <-|
  j
        ID |
                          PLUS
       ADOP |
  +|
  11
       INTCT |
                            1
                        XXXXXXXX
  )|
      CLPAR |
      OPBRACE |
  \{|
                          XXXXXXXX
                     XXXXXXXX
  if|
        IF |
  (
      OPPAR |
                        XXXXXXXX
nomes ID |
                          nomes
  OPBRAK |
                         XXXXXXXX
  i
        ID |
                         XXXXXXXX
      COMMA |
        ID |
  jΙ
  ][
                         XXXXXXX
      CLBRAK |
      RELOP |
                            ΕQ
 10/
      CHARCT |
                            \0
  )|
                        XXXXXXX
      CLPAR |
 fim
         ID |
                         fim
  <-|
       ASSIGN |
                         XXXXXXX
 true
      TRUE |
                         XXXXXXXX
  ;
      SCOLON |
                         XXXXXXXX
        ELSE |
                        XXXXXXXX
else
write|
        WRITE |
                         XXXXXXXX
      OPPAR |
                        XXXXXXXX
  (|
        ID |
nomes
                          nomes
  OPBRAK |
                         XXXXXXXX
  i|
        ID |
      COMMA |
                         XXXXXXX
  jΙ
      ID |
  CLBRAK |
                         XXXXXXXX
      CLPAR |
                        XXXXXXX
  ;|
      SCOLON |
                         XXXXXXXX
  }|
      CLBRACE |
                          XXXXXXXX
write|
        WRITE |
                         XXXXXXXX
      OPPAR |
                        XXXXXXXX
                         " | "
      STRING |
                         XXXXXXX
      COMMA |
  ᆡ
         ID l
nocorr
                         nocorr
                         XXXXXXX
  OPBRAK |
  i|
        ID |
                         i
```

```
][
               CLBRAK |
                                 XXXXXXXX
           )|
               CLPAR |
                                 XXXXXXXX
           ;|
               SCOLON |
                                 XXXXXXXX
           }|
               CLBRACE |
                                   XXXXXXXX
           }|
               CLBRACE |
                                  XXXXXXXX
                                 XXXXXXXX
         main|
                  MAIN |
           {|
               OPBRACE |
                                  XXXXXXXX
         local LOCAL |
                                 XXXXXXXX
           :|
                                 XXXXXXXX
               COLON |
                 INT |
                                XXXXXXXX
          int|
           i
                ID |
                                  i
               COMMA |
                                  XXXXXXXX
         posic
                ID |
                                  posic
               SCOLON |
           ;|
                                  XXXXXXXX
         char|
                 CHAR |
                                  XXXXXXXX
           c
                 ID |
           ;|
               SCOLON |
                                  XXXXXXXX
         logic|
                 LOGIC |
                                  XXXXXXX
                 ID |
          fim
                                  fim
               SCOLON |
                                  XXXXXXX
           ;|
      statements | STATEMENTS |
                                        XXXXXXXX
                                 XXXXXXX
           :|
               COLON |
         ntab|
                  ID |
                                  ntab
           <-|
               ASSIGN |
                                  XXXXXXXX
           0|
               INTCT |
                                    0
                                  XXXXXXXX
           ;|
               SCOLON |
         write|
                 WRITE |
                                  XXXXXXXX
           (|
               OPPAR |
                                 XXXXXXX
                                "Nova palavra? (s/n): "
"Nova palavra? (s/n): "| STRING |
                                 XXXXXXXX
               CLPAR |
           )|
           ;|
               SCOLON |
                                  XXXXXXXX
                 READ |
                                  XXXXXXXX
         read
           (|
               OPPAR |
                                 XXXXXXXX
                 ID |
           c
                                 C
                                 XXXXXXXX
           )|
               CLPAR |
                                XXXXXXX
               SCOLON |
           ;|
         while|
                 WHILE |
                                 XXXXXXXX
                                 XXXXXXXX
           OPPAR |
           c
                 ID |
                                  С
                                     EQ
                RELOP |
          's'|
               CHARCT |
                                     S
           Ш
                 OR |
                               XXXXXXXX
           c
                 ID |
                                  С
                                     EQ
           =|
                RELOP |
          'S'l
                                      S
               CHARCT |
           )|
               CLPAR |
                                XXXXXXXX
           {|
               OPBRACE |
                                  XXXXXXXX
                 WRITE |
                                  XXXXXXXX
         write
```

```
OPPAR |
                                   XXXXXXXX
           (|
"\nDigite a palavra: "| STRING |
                                  "\nDigite a palavra: "
                CLPAR |
           )|
                                   XXXXXXXX
           ;|
                SCOLON |
                                    XXXXXXXX
          fim|
                   ID |
                                    fim
           <-|
                ASSIGN |
                                    XXXXXXX
         false|
                FALSE |
                                    XXXXXXX
                SCOLON |
           ;|
                                    XXXXXXXX
          for
                  FOR |
                                  XXXXXXXX
           (|
                OPPAR |
                                   XXXXXXXX
           i|
                  ID |
                                    i
                ASSIGN |
                                    XXXXXXXX
           <-|
           0
                INTCT |
                                       0
           ;|
                                    XXXXXXXX
                SCOLON |
           !|
                 NOT |
                                  XXXXXXXX
          fim|
                   ID |
                                    fim
                SCOLON |
                                    XXXXXXX
           ;|
           i|
                  ID |
                                    i
                ASSIGN |
                                    XXXXXXX
           <-|
           i|
                  ID |
                                    i
                                      PLUS
            +|
                 ADOP |
           1|
                INTCT |
                                       1
           )|
                                   XXXXXXX
                CLPAR |
            \{|
               OPBRACE |
                                     XXXXXXXX
                  READ |
                                    XXXXXXXX
          read
           OPPAR |
                                   XXXXXXXX
        palavra|
                   ID |
                                    palavra
           OPBRAK |
                                    XXXXXXX
           i|
                  ID |
           ][
                CLBRAK |
                                    XXXXXXXX
           )|
                CLPAR |
                                   XXXXXXXX
           ;|
                SCOLON |
                                    XXXXXXXX
                                XXXXXXXX
           if|
                  IF |
           (|
                OPPAR |
                                   XXXXXXXX
        palavra|
                    ID |
                                    palavra
                OPBRAK |
           XXXXXXXX
                  ID |
           i|
                                    i
           ][
                                    XXXXXXXX
                CLBRAK |
                                       EQ
                RELOP |
            =1
          '\n'|
                CHARCT |
                                       \n
                                   XXXXXXXX
           )|
                CLPAR |
            \{|
               OPBRACE |
                                     XXXXXXXX
          fim|
                   ID |
                                    fim
           <-|
                ASSIGN |
                                    XXXXXXXX
          true
                  TRUE |
                                    XXXXXXX
           ;|
                SCOLON |
                                    XXXXXXXX
        palavra|
                    ID |
                                    palavra
                OPBRAK |
                                    XXXXXXXX
```

```
i|
                    ID |
                                       i
              ][
                                       XXXXXXX
                  CLBRAK |
              <-|
                  ASSIGN |
                                       XXXXXXXX
             10/
                   CHARCT |
                                          \0
              ;|
                  SCOLON |
                                       XXXXXXXX
                  CLBRACE |
                                        XXXXXXXX
              }|
                  CLBRACE |
              }|
                                        XXXXXXXX
                      ID |
            posic
                                       posic
                   ASSIGN |
              <-|
                                       XXXXXXX
           Procura|
                       ID |
                                       Procura
                   OPPAR |
                                      XXXXXXXX
              (|
              )|
                   CLPAR |
                                     XXXXXXXX
                  SCOLON |
                                       XXXXXXXX
              ;|
              if|
                    IF |
                                   XXXXXXXX
              (|
                   OPPAR |
                                      XXXXXXXX
                      ID |
                                       posic
            posic
                                          GT
              >|
                    RELOP |
              0
                   INTCT |
                                          0
                                      XXXXXXX
              )|
                   CLPAR |
           nocorr
                       ID |
                                       nocorr
                                       XXXXXXX
                  OPBRAK |
              []
            posic
                      ID |
                                       posic
              ]|
                  CLBRAK |
                                       XXXXXXXX
              <-|
                   ASSIGN |
                                       XXXXXXXX
           nocorr
                       ID |
                                       nocorr
                  OPBRAK |
                                       XXXXXXXX
              ID |
            posic
                                       posic
              ][
                  CLBRAK |
                                       XXXXXXX
              +|
                                        PLUS
                    ADOP |
              1|
                   INTCT |
                                          1
              ;|
                  SCOLON |
                                       XXXXXXX
             else
                    ELSE |
                                      XXXXXXXX
                    CALL |
                                      XXXXXXXX
            call
           Inserir|
                      ID |
                                      Inserir
              (|
                   OPPAR |
                                      XXXXXXXX
                                     XXXXXXXX
              ~|
                     NEG |
            posic|
                      ID |
                                       posic
                   COMMA |
                                       XXXXXXXX
              i
                    ID |
                                       i
              )|
                                     XXXXXXX
                   CLPAR |
                                       XXXXXXXX
                  SCOLON |
            write|
                     WRITE |
                                       XXXXXXXX
              (|
                   OPPAR |
                                     XXXXXXXX
"\n\nNova palavra? (s/n): "
                           STRING | "\n\nNova palavra? (s/n): "
                   CLPAR |
                                     XXXXXXX
              ;|
                  SCOLON |
                                       XXXXXXXX
            read
                     READ |
                                       XXXXXXXX
              (|
                   OPPAR |
                                      XXXXXXXX
```

c ID) CLPAR ; SCOLON } CLBRACE call CALL ExibirTabela ID (OPPAR) CLPAR ; SCOLON	c XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX ExibirTabela XXXXXXXX XXXXXXXX XXXXXXXX
<i>′</i> 1	