# Memoria de la Práctica de Procesadores de Lenguajes: Analizador Sintáctico

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## Índice

# 1 Diseño del Analizador Sintáctico

## 1.1 Gramática

$Terminales = \{ \; ; \; \{ \; \} \; id \; ent \; cadena \; ( \; ) \; + \; < \; ! \; = \; |= \; var \; int \; boolean \; string \; print \; input \; , \; return \; function \; if \; else \; \}$

$NoTerminales = \{ \; P \; D \; T \; F \; T1 \; A \; K \; C \; S \; L \; M \; Q \; S1 \; G \; X \; E \; U \; R \; V \; S2 \; \}$

$Axioma = P$

$Producciones = \{$

$P \rightarrow D \; P$

$P \rightarrow F \; P$

$P \rightarrow S \; P$

$D \rightarrow var \; T \; id \; ;$

$T \rightarrow int$

$T \rightarrow string$

$T \rightarrow boolean$

$F \rightarrow function \; T1 \; id \; ( \; A \; ) \; \{ \; C \; \}$

$T1 \rightarrow \lambda$

$T1 \rightarrow T$

$A \rightarrow T \; id \; K$

$A \rightarrow \lambda$

$K \rightarrow \lambda$

$K \rightarrow , \; T \; id \; K$

$C \rightarrow D \; C$

$C \rightarrow S \; C$

$C \rightarrow \lambda$

$S \rightarrow id \; L \; E \; ;$

$S \rightarrow id \; ( \; M \; ) \; ;$

$S \rightarrow print \; ( \; E \; ) \; ;$

$S \rightarrow input \; ( \; id \; ) \; ;$

$S \rightarrow if \; ( \; E \; ) \; S1$

$S \rightarrow return \; X \; ;$

$L \rightarrow |=$

$L \rightarrow =$

$M \rightarrow E \; Q$

$M \rightarrow \lambda$

$Q \rightarrow \lambda$

$Q \rightarrow , \; E \; Q$

$S1 \rightarrow \{ \; S2 \; \} \; G$

$S1 \rightarrow S$

$G \rightarrow else \; \{ \; S2 \; \}$

$G \rightarrow \lambda$

$X \rightarrow E$

$X \rightarrow \lambda$

$E \rightarrow E < U$

$E \rightarrow U$

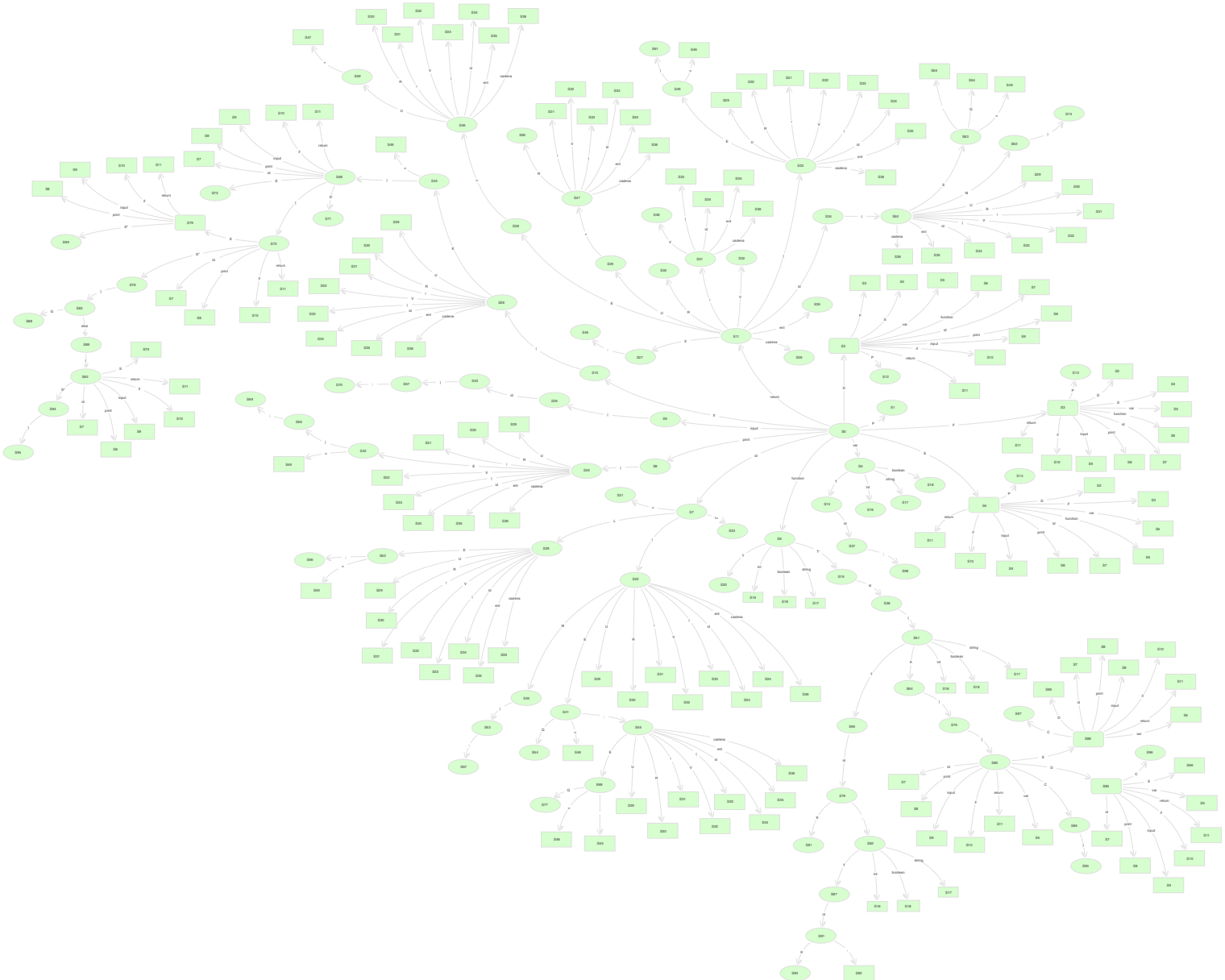
$U \rightarrow U + R$

$U \rightarrow R$

$R \rightarrow\ !\ V$
$R \rightarrow\ V$
$V \rightarrow\ (\ E\ )$
$V \rightarrow\ id$
$V \rightarrow\ id\ (\ M\ )$
$V \rightarrow\ ent$
$V \rightarrow\ cadena$
$S2 \rightarrow\ S\ \ S2$
$S2 \rightarrow\ S$
$P \rightarrow\ \lambda$

}

## 1.2 Autómata Reconocedor de Prefijos Viables



### 1.2.1 Estados del autómata

$S_0$={P1 →• P, P → • DP, P → • SP, P → • , D → • var T id;,
F → • function T1 id(A){C}, S → • id L E;, S → • id(M);
S → • print(E);, S → • input(id);, S → • if(E) S1,
S → • return X;}
$S_1$={P1 →P •}
$S_2$={P →D • P, P → • DP, P → • SP, P → • , D → • var T id;,
F → • function T1 id(A){C}, S → • id L E;, S → • id(M);
S → • print(E);, S → • input(id);, S → • if(E) S1,
S → • return X;}
$S_3$={P →F • P, P → • DP, P → • FP, P → • SP, P → •,
D → • var T id;,F → • function T1 id(A){C},
S → • id L E;, S → • id(M);, S → • print(E);,
S → • input(id);, S → • if(E) S1, S → • return X;}
$S_4$={P →S • P, P → • DP, P → • FP, P → • SP, P → •,
D → • var T id;, F → • function T1 id(A){C},
S → • id L E;, S → • id(M);, S → • print(E);,
S → • input(id);, S → • if(E) S1, S → • return X;}
$S_5$={D → var • T id;, T → • int , T → • string , T → • boolean}
$S_6$={F → function • T1 id(A){C}, T1 → •, T1 → • T,
T → • int , T → • string , T → • boolean}
$S_7$={S → id • L E;, S → id • (M);, L → |=, L → • =}
$S_8$={S → print • (E);}
$S_9$={S → input • (id);}
$S_{10}$={S → if • (E) S1}
$S_{11}$={S →return • X;, X → •, X → • E, E → • E < U, E → • U,
U → • U + R, U → • R, R → • ! V, R → • V, V → • (E),
V → • id , V → • id(M) , V → • ent , V → • cadena}
$S_{12}$={P →DP •}
$S_{13}$={P →FP •}
$S_{14}$={P →SP •}
$S_{15}$={D →var T • id;}
$S_{16}$={T →int •}
$S_{17}$={T →string •}
$S_{18}$={T →boolean •}
$S_{19}$={F →function T1 • id(A){C}}
$S_{20}$={T1 →T •}
$S_{21}$={L →= •}
$S_{22}$={S →id ( •M);, M → • E Q, M → •, E → • E < U, E → • U,
U → • U + R, U → • R, R → • ! V, R → • V, V → • (E),
V → • id , V → • id(M) , V → • ent , V → • cadena}
$S_{23}$={L →|= •}
$S_{24}$={S →print ( • E);, E → • E < U, E → • U, U → • U + R,
U → • R, R → • ! V, R → • V, V → • (E), V → • id ,
V → • id(M) , V → • ent , V → • cadena}
$S_{25}$={S →input ( • id)}
$S_{26}$={S →if ( • E) S1, E → • E < U, E → • U, U → • U + R,
U → • R, R → • ! V, R → • V, V → • (E), V → • id ,
V → • id(M) , V → • ent , V → • cadena}
$S_{27}$={S →return X • ;}
$S_{28}$={X →E •, E → E • < U}
$S_{29}$={E →U •, U → U • + R}
$S_{30}$={U →R •}
$S_{31}$={R →! • V, V → • (E), V → • id , V → • id(M) ,
V → • ent , V → • cadena}
$S_{32}$={R →V •}
$S_{33}$={V →( • E), E → • E < U, E → • U, U → • U + R,

U → • R, R → • ! V, R → • V, V → • (E), V → • id,
V → • id(M), V → • ent, V → • cadena}

$S_{34}$={V →id •, V → id • (M)}

$S_{35}$={V →ent •}

$S_{36}$={V →cadena •}

$S_{37}$={D →var T id •;}

$S_{38}$={F →function T1 id • (A){C}}

$S_{39}$={S →id L • E, E → • E < U, E → • U, U → • U + R,
U → • R, R → • ! V, R → • V, V → • (E), V → • id,
V → • id(M), V → • ent, V → • cadena}

$S_{40}$={S →id (M • );}

$S_{41}$={M →E • Q, E → E • < U, Q → •, Q → • ,EQ}

$S_{42}$={S →print(E •);, E → E • < U}

$S_{43}$={S →input(id •);}

$S_{44}$={S →if(E •) S1, E → E • < U}

$S_{45}$={S →return X; •}

$S_{46}$={E →E < • U, U → • R, U → • U + R, R→ • ! V, R → • V
V → • (E), V → • id, V → • id(M), V → • ent, V → • cadena}

$S_{47}$={U →U + • R, R → • ! V, V → • (E), V → • id(M),
V → • ent, V → • cadena}

$S_{48}$={R →! V •}

$S_{49}$={V →(E •), E → E • < U}

$S_{50}$={V →id(• M), M → • E Q, M → •, E → • E < U, E → • U,
U → • U + R, U → • R, R → • ! V, R → • V, V → • (E),
V → • id, V → • id(M), V → • ent, V → • cadena}

$S_{51}$={F →function T1 id(• A){C}, A → • T id K, A → •, T → • int,
T → • string, T → • boolean}

$S_{52}$={S →id L E • ;, E → E • < U}

$S_{53}$={S →id(M) • ;}

$S_{54}$={M →E Q •}

$S_{55}$={Q →, • E Q, E → • E < U, E → • U,
U → • U + R, U → • R, R → • ! V, R → • V, V → • (E),
V → • id, V → • id(M), V → • ent, V → • cadena}

$S_{56}$={S →print(E) • ;}

$S_{57}$={S →input(id) • ;}

$S_{58}$={S →if(E) • S1, S1 → • {S2}G, S1 → • S, S → • id L E;,
S → • id(M);, S → • print(E);, S → • input(id);,
S → • if(E)S1, S → • return X ;}

$S_{59}$={E →E < U •, U → U • + R}

$S_{60}$={U →U + R •}

$S_{61}$={V →(E) •}

$S_{62}$={V →id(M •)}

$S_{63}$={M →E • Q, E → E • < U, Q → •, Q → • ,EQ}

$S_{64}$={F →function T1 id(A •){C}}

$S_{65}$={A →T • id K}

$S_{66}$={S →id L E ; •}

$S_{67}$={S →id (M); •}

$S_{68}$={Q →,E • Q, E → E • < U, Q → •, Q → • ,EQ}

$S_{69}$={S →print(E); •}

$S_{70}$={S →input(id); •}

$S_{71}$={S →if(E) S1 •}

$S_{72}$={S1 →{• S2}G, S2 → • S S2, S2 → • S, S → • id L E;,
S → • id(M);, S → • print(E);, S → • input(id);,
S → • if(E)S1, S → • return X ;}

$S_{73}$={S1 →S •}

$S_{74}$={S2 →S • S2 , S2 → S • , S2 → • S S2, S2 → • S,
S → • id L E ;, S → • id ( M ) ;, S → • print ( E ) ;,
S → • input ( id ) ;, S → • if ( E ) S1, S → • return X ;}

$S_{75}$={F →function T1 id (K) • {C}}
$S_{76}$={A →T id •K , K → • , K → • , T id K}
$S_{77}$={Q → , E Q •}
$S_{78}$={S1 →{S2 • } G}
$S_{79}$={S2 →S • S2, S2 → S •, S2 → • S S2, S → • id L E;,
S → • id(M);, S → • print(E); S → • if(E)S1;,
S → • input(id);, S → return X;}
$S_{80}$={F →function T1 id (K) { •C}, C → • D C , C → • ,
D → • var T id ;, S → • id L E , S → • id (M);,
S → • print (E);, S → • input (id);, S → • if (E) S1,
S → • return X ;}
$S_{81}$={A →T id K •}
$S_{82}$={K → , •T id K, T → • int , T → • string , T → • boolean}
$S_{83}$={S1 →{S2} •G , G → • else {S2} , G → •}
$S_{84}$={F →function T1 id (K) {C • }}
$S_{85}$={C →D •C, C → • D C, C → • S C, C → •, D → • var T id ;,
S → • id L E ;, S → • id ( M ) ;, S → • print ( E ) ;,
S → • input ( id ) ;, S → • if ( E ) S1, S → • return X ;}
$S_{86}$={C →S •C, C → • D C, C → • S C, C → •, D → • var T id ;,
S → • id L E ;, S → • id ( M ) ;, S → • print ( E ) ;,
S → • input ( id ) ;, S → • if ( E ) S1, S → • return X ;}
$S_{87}$={K → , T • id K}
$S_{88}$={S1 →{S2} G •}
$S_{89}$={G →else • {S2}}
$S_{90}$={F →function T1 id (K) {C} •}
$S_{91}$={K → , T id •K, K → •, K → • , T id K}
$S_{92}$={G →else { • S2}, S2 → • S S2, S2 → • S, S → • id L E ;,
S → • id ( M ) ; , S → • print ( E ) ;, S → • input(id);,
S → • if ( E ) S1, S → • return X ;}
$S_{93}$={K → , T id K •}
$S_{94}$={G →else { S2 • }}
$S_{95}$={G →else { S2 } •}
$S_{96}$={C →D C •}
$S_{97}$={C →S C •}
$S_{98}$={D →var T id ; •}
$S_{99}$={S2 →S S2 •}

## 1.3 Conflictos

Como podemos observar en la tabla de decisión no hay ningún conflicto.

Los posibles conflictos son:

### Reducción-Reducción

Podríamos ver como en los posibles estados con este conflicto, en nuestro caso ninguno, se verifica que

$\forall$ {A $\rightarrow \alpha \bullet$, B $\rightarrow \beta \bullet$} $\subset S_x \Rightarrow$ Follow(A) $\cap$ Follow(B) = $\emptyset$ (Esto lo podemos observar al no tener dos entradas de reducción en la misma celda de cada fila de $S_x$ )

### Reducción-Desplazamiento

Podemos ver como en los posibles estados con este conflicto, S0, S2, S3, S4, S6, S11, S22, S28, S29, S34, S41, S50, S51, S59, S63, S68, S76, S79, S80, S83, S85, S86, S91, se verifica que

$\forall$ {A $\rightarrow \alpha \bullet$ b $\gamma$, C $\rightarrow \beta \bullet$} $\subset S_x \Rightarrow$ b $\notin$ Follow(C) (Esto lo podemos observar al no tener una entrada de desplazamiento y otra de reducción en la misma celda de

cada fila de $S_x$ )

# 2 Anexo de Pruebas

Prueba 1 Correcta

```
var int a;
var int b;
var int c;
print ('Introduce el primer operando');
input (a);
print ('Introduce el segundo operando');
input (b);
function int suma (int num1, int num2)
{
  var int res;
  res = num1+num2;
  return res;
}
c = suma (a, b);
print (c);
```

A 5 4 5 4 5 4 46 41 39 37 20 21 46 41 39 37 20 21 5 10 5 5 13 14 11 5 4 25 43 41 39 43 41 38 37 18 43 41 39 37 34 23 17 16 16 15 8 25 43 41 39 37 43 41 39 37 28 29 26 44 41 39 37 18 43 41 39 37 20 49 3 3 2 3 3 3 3 1 1 1

Prueba 2 Correcta

```
var string texto;
function imprime (string msg)
{
  print ('Mensage introducido:');
  print (msg);
}
function pideTexto ()
{
  print ('Introduce un texto');
  input (texto);
}
pideTexto();
imprime (texto);
```

A 6 4 9 6 13 11 46 41 39 37 20 43 41 39 37 20 17 16 16 8 9 12 46 41 39 37 20 21 17 16 16 8 27 19 43 41 39 37 28 26 19 49 3 3 2 2 1

Prueba 3 Correcta

```
var string s;
var int    uno;
var int    UNO;
function int Factorial (int n)
{
  if (n < 0)  return 1;
  return n + Factorial (n + 1);
}
var int For;
var int functional;
```

| | ; | { | } | id | entero | cadena | ( | ) | + | < | ! | = | —= | var | int | boolean | string | print | input | , | return | function | if | else | $ | P | D | T | F | T' | A | K | C | S | L | M | Q | S' | G | X | E | U | R | V | S" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S0 | | | | d7 | | | | | | | | | | d5 | | | | d8 | d9 | | d11 | d6 | d10 | | r49 | 1 | 2 | | 3 | | | | 4 | | | | | | | | | | | | |
| S1 | | | | | | | | | | | | | | | | | | | | | | | | | a | | | | | | | | | | | | | | | | | | | | |
| S2 | | | | d7 | | | | | | | | | | d5 | | | | d8 | d9 | | d11 | d6 | d10 | | r49 | 12 | 2 | | 3 | | | | 4 | | | | | | | | | | | | |
| S3 | | | | d7 | | | | | | | | | | d5 | | | | d8 | d9 | | d11 | d6 | d10 | | r49 | 13 | 2 | | 3 | | | | 4 | | | | | | | | | | | | |
| S4 | | | | d7 | | | | | | | | | | d5 | | | | d8 | d9 | | d11 | d6 | d10 | | r49 | 14 | 2 | | 3 | | | | 4 | | | | | | | | | | | | |
| S5 | | | | | | | | | | | | | | | d16 | d18 | d17 | | | | | | | | | | | 15 | | | | | | | | | | | | | | | | | |
| S6 | | | | r9 | | | | | | | | | | | d16 | d18 | d17 | | | | | | | | | | | 20 | | 19 | | | | | | | | | | | | | | | | |
| S7 | | | | | | | d22 | | | | | d21 | d23 | | | | | | | | | | | | | | | | | | | | | 39 | | | | | | | | | | | |
| S8 | | | | | | | d24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S9 | | | | | | | d25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S10 | | | | | | | d26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S11 | r35 | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 27 | 28 | 29 | 30 | 32 | |
| S12 | | | | | | | | | | | | | | | | | | | | | | | | | r1 | | | | | | | | | | | | | | | | | | | | |
| S13 | | | | | | | | | | | | | | | | | | | | | | | | | r2 | | | | | | | | | | | | | | | | | | | | |
| S14 | | | | | | | | | | | | | | | | | | | | | | | | | r3 | | | | | | | | | | | | | | | | | | | | |
| S15 | | | | d37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S16 | | | | r5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S17 | | | | r6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S18 | | | | r7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S19 | | | | d38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S20 | | | | r10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S21 | | | | r25 | r25 | r25 | r25 | | | | r25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S22 | | | | d34 | d35 | d36 | d33 | r27 | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 41 | 29 | 30 | 32 | |
| S23 | | | | r24 | r24 | r24 | r24 | | | | r24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S24 | | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 42 | 29 | 30 | 32 | |
| S25 | | | | d43 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S26 | | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 44 | 29 | 30 | 32 | |
| S27 | d45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S28 | r34 | | | | | | | | | | d46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S29 | r37 | | | | | | | r37 | d47 | r37 | | | | | | | | | | | r37 | | | | | | | | | | | | | | | | | | | | | | | |
| S30 | r39 | | | | | | | r39 | r39 | r39 | | | | | | | | | | | r39 | | | | | | | | | | | | | | | | | | | | | | | |
| S31 | | | | d34 | d35 | d36 | d33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 48 | |
| S32 | r41 | | | | | | | r41 | r41 | r41 | | | | | | | | | | | r41 | | | | | | | | | | | | | | | | | | | | | | | |
| S33 | | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 49 | 29 | 30 | 32 | |
| S34 | r43 | | | | | | d50 | r43 | r43 | r43 | | | | | | | | | | | r43 | | | | | | | | | | | | | | | | | | | | | | | |
| S35 | r45 | | | | | | | r45 | r45 | r45 | | | | | | | | | | | r45 | | | | | | | | | | | | | | | | | | | | | | | |
| S36 | r46 | | | | | | | r46 | r46 | r46 | | | | | | | | | | | r46 | | | | | | | | | | | | | | | | | | | | | | | |
| S37 | d98 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S38 | | | | | | | d51 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S39 | | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 52 | 29 | 30 | 32 | |
| S40 | | | | | | | | d53 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S41 | | | | | | | | r28 | | d46 | | | | | | | | | | | d55 | | | | | | | | | | | | | | | | | | | 54 | | | | | | |
| S42 | | | | | | | | d56 | | d46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S43 | | | | | | | | d57 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S44 | | | | | | | | d58 | | d46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S45 | | | r23 | r23 | | | | | | | | | | r23 | | | | r23 | r23 | | r23 | r23 | r23 | | r23 | | | | | | | | | | | | | | | | | | | |
| S46 | | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 59 | 30 | 32 | |
| S47 | | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 60 | 32 | |
| S48 | r40 | | | | | | | r40 | r40 | r40 | | | | | | | | | | | r40 | | | | | | | | | | | | | | | | | | | | | | | |
| S49 | | | | | | | | d61 | | d46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | ; | { | } | id | entero | cadena | ( | ) | + | < | ! | = | —= | var | int | boolean | string | print | input | , | return | function | if | else | $ | P | D | T | F | T' | A | K | C | S | L | M | Q | S' | G | X | E | U | R | V | S" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S50 | | | | d34 | d35 | d36 | d33 | r27 | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | 62 | | | | | 63 | 29 | 30 | 32 | |
| S51 | | | | | | | | r12 | | | | | | | d16 | d18 | d17 | | | | 65 | | | 64 | | | | | | | | | | | | | | | | | | | | | | |
| S52 | d66 | | | | | | | | | d46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S53 | d67 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S54 | | | | | | | | r26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S55 | | | | d34 | d35 | d36 | d33 | | | | d31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 68 | 29 | 30 | 32 | |
| S56 | d69 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S57 | d70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S58 | | d72 | | d7 | | | | | | | | | | | | | | d8 | d9 | | d11 | | d10 | | | | | | | | | | 73 | | | | 71 | | | | | | | | |
| S59 | r36 | | | | | | | r36 | d47 | r36 | | | | | | | | | | r36 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S60 | r38 | | | | | | | r38 | r38 | r38 | | | | | | | | | | r38 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S61 | r42 | | | | | | | r42 | r42 | r42 | | | | | | | | | | r42 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S62 | | | | | | | | d74 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S63 | | | | | | | | r28 | | d46 | | | | | | | | | | d55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S64 | | | | | | | | d75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S65 | | | | d76 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S66 | | | r18 | r18 | | | | | | | | | | r18 | | | | r18 | r18 | | r18 | r18 | r18 | | r18 | | | | | | | | | | | | | | | | | | | |
| S67 | | | r19 | r19 | | | | | | | | | | r19 | | | | r19 | r19 | | r19 | r19 | r19 | | r19 | | | | | | | | | | | | | | | | | | | |
| S68 | | | | | | | | r28 | | d46 | | | | | | | | | | d55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S69 | | | r20 | r20 | | | | | | | | | | r20 | | | | r20 | r20 | | r20 | r20 | r20 | | r20 | | | | | | | | | | | | | | | | | | | |
| S70 | | | r21 | r21 | | | | | | | | | | r21 | | | | r21 | r21 | | r21 | r21 | r21 | | r21 | | | | | | | | | | | | | | | | | | | |
| S71 | | | r22 | r22 | | | | | | | | | | r22 | | | | r22 | r22 | | r22 | r22 | r22 | | r22 | | | | | | | | | | | | | | | | | | | |
| S72 | | | | d7 | | | | | | | | | | | | | | d8 | d9 | | d11 | | d10 | | | | | | | | | | 79 | | | | | | | | | | | 78 |
| S73 | | | r31 | r31 | | | | | | | | | | r31 | | | | r31 | r31 | | r31 | r31 | r31 | | r31 | | | | | | | | | | | | | | | | | | | |
| S74 | r44 | | | | | | | r44 | r44 | r44 | | | | | | | | | | r44 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S75 | | d80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S76 | | | | | | | | r13 | | | | | | | | | | | | d82 | | | | | | | | | | | | | | 81 | | | | | | | | | | |
| S77 | | | | | | | | r29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S78 | | | d83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S79 | | | r48 | d7 | | | | | | | | | | | | | | d8 | d9 | | d11 | | d10 | | | | | | | | | | 79 | | | | | | | | | | | 99 |
| S80 | | | r17 | d7 | | | | | | | | | | d5 | | | | d8 | d9 | | d11 | | d10 | | | | 85 | | | | | | 84 | 86 | | | | | | | | | |
| S81 | | | | | | | | r11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S82 | | | | | | | | | | | | | | | d16 | d18 | d17 | | | | | | | | | | | 87 | | | | | | | | | | | | | | | | |
| S83 | | | r33 | r33 | | | | | | | | | | r33 | | | | r33 | r33 | | r33 | r33 | r33 | d89 | r33 | | | | | | | | | | | | 88 | | | | | | |
| S84 | | | d90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S85 | | | r17 | d7 | | | | | | | | | | d5 | | | | d8 | d9 | | d11 | | d10 | | | | | | | | | | 96 | 86 | | | | | | | | | |
| S86 | | | r17 | d7 | | | | | | | | | | d5 | | | | d8 | d9 | | d11 | | d10 | | | | 85 | | | | | | 97 | 86 | | | | | | | | | |
| S87 | | | | d91 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S88 | | | r30 | r30 | | | | | | | | | | r30 | | | | r30 | r30 | | r30 | r30 | r30 | | r30 | | | | | | | | | | | | | | | | | | | |
| S89 | | d92 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S90 | | | | r8 | | | | | | | | | | r8 | | | | r8 | r8 | | r8 | r8 | r8 | | r8 | | | | | | | | | | | | | | | | | | | |
| S91 | | | | | | | | r13 | | | | | | | | | | | | d82 | | | | | | | | | | | | | | 93 | | | | | | | | | | |
| S92 | | | | d7 | | | | | | | | | | | | | | d8 | d9 | | d11 | | d10 | | | | | | | | | | 79 | | | | | | | | | | | 94 |
| S93 | | | | | | | | r14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S94 | | | d95 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S95 | | | r32 | r32 | | | | | | | | | | r32 | | | | r32 | r32 | | r32 | r32 | r32 | | r32 | | | | | | | | | | | | | | | | | | | |
| S96 | | | r15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S97 | | | r16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S98 | | | r4 | r4 | | | | | | | | | | r4 | | | | r4 | r4 | | r4 | r4 | r4 | | r4 | | | | | | | | | | | | | | | | | | | |
| S99 | | | r47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

```
var int While;

function imprime (string s, string msg, int f)
{
  print (s); print (msg); print (f);
  return;
}
function string cadena (boolean log)
{
  if (!log)
  {
    imprime (s, 'hola', 33);
    if (uno < UNO)  return s;
  }
  else
  {
    return 'Fin';
  }
}
s = 'El factorial ';

print (s);
print ('Introduce un numero•');
input (num);
var
boolean
booleano;
if (num < 0)    print ('No existe el factorial de un negativo•');
imprime (cadena (booleano), 'recursivo es: ', Factorial (num));
```

A 6 4 5 4 5 4 5 10 5 13 11 43 41 39 37 45 41 39 36 45 41 39 37 34 23 31 22 43 41 39 43 41 39 45 41 38 37 28 26 44 41 38 37 34 23 17 16 16 8 5 4 5 4 5 4 9 6 6 5 13 14 14 11 43 41 39 37 20 43 41 39 37 20 43 41 39 37 20 35 23 17 16 16 16 16 8 6 10 7 13 11 43 40 39 37 43 41 39 37 46 41 39 37 45 41 39 37 28 29 29 26 19 43 41 39 37 43 41 39 36 43 41 39 37 34 23 31 22 48 47 46 41 39 37 34 23 48 32 30 22 17 16 8 25 46 41 39 37 18 43 41 39 37 20 46 41 39 37 20 21 7 4 43 41 39 37 45 41 39 36 46 41 39 37 20 31 22 43 41 39 37 28 26 44 41 39 37 46 41 39 37 43 41 39 37 28 26 44 41 39 37 28 29 29 26 19 49 3 3 1 3 3 3 3 2 2 1 1 1 2 1 1 1

Error 1

```
var int a;
var b;
a = 3;
b = a;
if (a < b) b = 1;
if (b < a) b = 8;
a = a + b;
print (a);
print (b);
```

Error Sintactico: Declaracion incorrecta de variable. Linea: 2

Error 2

```
var string texto;
function pideTexto ()
{
  print ('Introduce un texto');
```

```
5   input (texto);
6 }
7 function imprime (string msg,)
8 {
9   print (msg);
10 }
11 pideTexto();
12 var string textoAux;
13 textoAux = texto;
14 imprime (textoAux);
```

Error Sintactico: Declaracion incorrecta de funcion. Linea: 7

Error 3

```
1  var int a;
2  var int b;
3  a = 3;
4  b = a;
5  var boolean c;
6  c = a < b;
7  if (c) {
8   b = 1;
9  } else {
10 c = b < a;
11 if (c) b = 4;
12 a = a + b;
13 print (a);
14 print (b);
```

Error Sintactico: Sentencia condicional compuesta incorrecta. Linea: 14