|  |  |  |
| --- | --- | --- |
|  | GRAMÁTICA | PRODUCCIONES |
| P = PROGRAMA  B = BLOQUE  S = S  D = DECL\_VAR  I = IF  W = WHILE  C = COND  E = EXPR  T = TERM  F = FACTOR | P' -> P  P -> B  B -> S ;  B -> S ; B  S -> D  S -> I  S -> W  D -> var id = E  I -> if ( C ) { B }  W -> while ( C ) { B }  C -> id == id  C -> id != id  C -> id > id  C -> id < id  E -> T + E  E -> T - E  E -> T  T -> F \* T  T -> F / T  T -> F  F -> number  F -> id  F -> ( E ) | 0. P' → · P  1. P → · B  2. B → · S;  3. B → · S; B  4. S → · D  5. S → · I  6. S → · W  7. D → · var id = E  8. I → · if ( C ) { B }  9. W → · while ( C ) { B }  10. C → · id == id  11. C → · id != id  12. C → · id > id  13. C → · id < id  14. E → · T + E  15. E → · T - E  16. E → · T  17. T → · F \* T  18. T → · F / T  19. T → · F  20. F → · number  21. F → · id  22. F → · ( E ) |

PRIMEROS Y SIGUIENTES

| **FIRST / FOLLOW table** | | |
| --- | --- | --- |
| **Nonterminal** | **FIRST** | **FOLLOW** |
| P' | {var,if,while} | {$} |
| P | {var,if,while} | {$} |
| B | {var,if,while} | {$,}} |
| S | {var,if,while} | {;} |
| D | {var} | {;} |
| I | {if} | {;} |
| W | {while} | {;} |
| C | {id} | {)} |
| E | {number,id,(} | {;,)} |
| T | {number,id,(} | {+,-,;,)} |
| F | {number,id,(} | {\*,/,+,-,;,)} |

**SLR CLOSURE TABLE (CONJUNTOS DE ELEMENTOS)**

| **Goto** | **Kernel** | **Est.** | **Closure** | |
| --- | --- | --- | --- | --- |
|  | P' -> · P | 0 | P' -> · P  P -> · B  B -> · S ;  B -> · S ; B  S -> · D | S -> · I  S -> · W  D -> · var id = E  I -> · if ( C ) { B  W -> · while ( C ) { B } |
| goto(0, P) | P' -> P · | 1 | P' -> P · | |
| goto(0, B) | P -> B · | 2 | P -> B · | |
| goto(0, S) | B -> S · ;  B -> S · ; B | 3 | B -> S ·  B -> S · ; B | |
| goto(0, D) | S -> D · | 4 | S -> D · | |
| goto(0, I) | S -> I · | 5 | S -> I · | |
| goto(0, W) | S -> W · | 6 | S -> W · | |
| goto(0, var) | D -> var · id = E | 7 | D -> var · id = E | |
| goto(0, if) | I -> if · ( C ) { B } | 8 | I -> if · ( C ) { B } | |
| goto(0, while) | W -> while · ( C ) { B } | 9 | W -> while · ( C ) { B } | |
| goto(3, ;) | B -> S ; ·  B -> S ; · B | 10 | B -> S ; ·  B -> S ; · B  B -> · S ;  B -> · S ; B  S -> · D | S -> · I  S -> · W  D -> · var id = E  I -> · if ( C ) { B }  W -> · while ( C ) { B } |
| goto(7, id) | D -> var id · = E | 11 | D -> var id · = E | |
| goto(8, () | I -> if ( · C ) { B } | 12 | I -> if ( · C ) { B }  C -> · id == id  C -> · id != id | C -> · id > id  C -> · id < id |
| goto(9, () | W -> while ( · C ) { B } | 13 | W -> while ( · C ) { B }  C -> · id == id  C -> · id != id | C -> · id > id  C -> · id < id |
| goto(10, B) | B -> S ; B · | 14 | B -> S ; B · | |
| goto(10, S) | B -> S · ;  B -> S · ; B | 3 |  | |
| goto(10, D) | S -> D · | 4 |  | |
| goto(10, I) | S -> I · | 5 |  | |
| goto(10, W) | S -> W · | 6 |  | |
| goto(10, var) | D -> var · id = E | 7 |  | |
| goto(10, if) | I -> if · ( C ) { B } | 8 |  | |
| goto(10, while) | W -> while · ( C ) { B } | 9 |  | |
| goto(11, =) | D -> var id = · E | 15 | D -> var id = · E  E -> · T + E  E -> · T – E  E -> · T  T -> · F \* T | T -> · F / T  T -> · F  F -> · number  F -> · id  F -> · ( E ) |
| goto(12, C) | I -> if ( C · ) { B } | 16 | I -> if ( C · ) { B } | |
| goto(12, id) | C -> id · == id  C -> id · != id  C -> id · > id  C -> id · < id | 17 | C -> id · == id  C -> id · != id  C -> id · > id  C -> id · < id | |
| goto(13, C) | W -> while ( C · ) { B } | 18 | W -> while ( C · ) { B } | |
| goto(13, id) | C -> id · == id  C -> id · != id  C -> id · > id  C -> id · < id | 17 |  | |
| goto(15, E) | D -> var id = E · | 19 | D -> var id = E · | |
| goto(15, T) | E -> T · + E  E -> T · - E  E -> T · | 20 | E -> T · + E  E -> T · - E  E -> T · | |
| goto(15, F) | T -> F · \* T  T -> F · / T  T -> F · | 21 | T -> F · \* T  T -> F · / T  T -> F · | |
| goto(15, number) | F -> number · | 22 | F -> number · | |
| goto(15, id) | F -> id · | 23 | F -> id · | |
| goto(15, () | F -> ( · E ) | 24 | F -> ( · E )  E -> · T + E  E -> · T – E  E -> · T  T -> · F \* T | T -> · F / T  T -> · F  F -> · number  F -> · id  F -> · ( E ) |
| goto(16, )) | I -> if ( C ) · { B } | 25 | I -> if ( C ) · { B } | |
| goto(17, ==) | C -> id == · id | 26 | C -> id == · id | |
| goto(17, !=) | C -> id != · id | 27 | C -> id != · id | |
| goto(17, >) | C -> id > · id | 28 | C -> id > · id | |
| goto(17, <) | C -> id < · id | 29 | C -> id < · id | |
| goto(18, )) | W -> while ( C ) · { B } | 30 | W -> while ( C ) · { B } | |
| goto(20, +) | E -> T + · E | 31 | E -> T + · E  E -> · T + E  E -> · T – E  E -> · T  T -> · F \* T | T -> · F / T  T -> · F  F -> · number  F -> · id  F -> · ( E ) |
| goto(20, -) | E -> T - · E | 32 | E -> T - · E  E -> · T + E  E -> · T – E  E -> · T  T -> · F \* T | T -> · F / T  T -> · F  F -> · number  F -> · id  F -> · ( E ) |
| goto(21, \*) | T -> F \* · T | 33 | T -> F \* · T  T -> · F \* T  T -> · F / T  T -> · F | F -> · number  F -> · id  F -> · ( E ) |
| goto(21, /) | T -> F / · T | 34 | T -> F / · T  T -> · F \* T  T -> · F / T  T -> · F | F -> · number  F -> · id  F -> · ( E ) |
| goto(24, E) | F -> ( E · ) | 35 | F -> ( E · ) | |
| goto(24, T) | E -> T · + E  E -> T · - E  E -> T · | 20 |  | |
| goto(24, F) | T -> F · \* T  T -> F · / T  T -> F · | 21 |  | |
| goto(24, number) | F -> number · | 22 |  | |
| goto(24, id) | F -> id · | 23 |  | |
| goto(24, () | F -> ( · E ) | 24 |  | |
| goto(25, {) | I -> if ( C ) { · B } | 36 | I -> if ( C ) { · B }  B -> · S ;  B -> · S ; B  S -> · D  S -> · I | S -> · W  D -> · var id = E  I -> · if ( C ) { B }  W -> · while ( C ) { B } |
| goto(26, id) | C -> id == id · | 37 | C -> id == id · | |
| goto(27, id) | C -> id != id · | 38 | C -> id != id · | |
| goto(28, id) | C -> id > id · | 39 | C -> id > id · | |
| goto(29, id) | C -> id < id · | 40 | C -> id < id · | |
| goto(30, {) | W -> while ( C ) { · B } | 41 | W -> while ( C ) { · B }  B -> · S ;  B -> · S ; B  S -> · D  S -> · I | S -> · W  D -> · var id = E  I -> · if ( C ) { B }  W -> · while ( C ) { B } |
| goto(31, E) | E -> T + E · | 42 | E -> T + E · | |
| goto(31, T) | E -> T · + E  E -> T · - E  E -> T · | 20 |  | |
| goto(31, F) | T -> F · \* T  T -> F · / T  T -> F · | 21 |  | |
| goto(31, number) | F -> number · | 22 |  | |
| goto(31, id) | F -> id · | 23 |  | |
| goto(31, () | F -> ( · E ) | 24 |  | |
| goto(32, E) | E -> T - E · | 43 | E -> T - E · | |
| goto(32, T) | E -> T · + E  E -> T · - E  E -> T · | 20 |  | |
| goto(32, F) | T -> F · \* T  T -> F · / T  T -> F · | 21 |  | |
| goto(32, number) | F -> number · | 22 |  | |
| goto(32, id) | F -> id · | 23 |  | |
| goto(32, () | F -> ( · E ) | 24 |  | |
| goto(33, T) | T -> F \* T · | 44 | T -> F \* T · | |
| goto(33, F) | T -> F · \* T  T -> F · / T  T -> F · | 21 |  | |
| goto(33, number) | F -> number · | 22 |  | |
| goto(33, id) | F -> id · | 23 |  | |
| goto(33, () | F -> ( · E ) | 24 |  | |
| goto(34, T) | T -> F / T · | 45 | T -> F / T · | |
| goto(34, F) | T -> F · \* T  T -> F · / T  T -> F · | 21 |  | |
| goto(34, number) | F -> number · | 22 |  | |
| goto(34, id) | F -> id · | 23 |  | |
| goto(34, () | F -> ( · E ) | 24 |  | |
| goto(35, )) | F -> ( E ) · | 46 | F -> ( E ) · | |
| goto(36, B) | I -> if ( C ) { B · } | 47 | I -> if ( C ) { B · } | |
| goto(36, S) | B -> S · ;  B -> S · ; B | 3 |  | |
| goto(36, D) | S -> D · | 4 |  | |
| goto(36, I) | S -> I · | 5 |  | |
| goto(36, W) | S -> W · | 6 |  | |
| goto(36, var) | D -> var · id = E | 7 |  | |
| goto(36, if) | I -> if · ( C ) { B } | 8 |  | |
| goto(36, while) | W -> while · ( C ) { B } | 9 |  | |
| goto(41, B) | W -> while ( C ) { B · } | 48 | W -> while ( C ) { B · } | |
| goto(41, S) | B -> S · ;  B -> S · ; B | 3 |  | |
| goto(41, D) | S -> D · | 4 |  | |
| goto(41, I) | S -> I · | 5 |  | |
| goto(41, W) | S -> W · | 6 |  | |
| goto(41, var) | D -> var · id = E | 7 |  | |
| goto(41, if) | I -> if · ( C ) { B } | 8 |  | |
| goto(41, while) | W -> while · ( C ) { B } | 9 |  | |
| goto(47, }) | I -> if ( C ) { B } · | 49 | I -> if ( C ) { B } · | |
| goto(48, }) | W -> while ( C ) { B } · | 50 | W -> while ( C ) { B } · | |

TABLA TABLA DE ANÁLISIS SINTÁCTICO (LR TABLE)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Estado | ACTION | | | | | | | | | | | | | | | | | | | | GOTO | | | | | | | | | | |
| ; | var | id | = | + | - | \* | / | number | if | while | ( | ) | { | } | == | != | > | < | $ | P' | P | B | S | D | I | W | C | E | T | F |
| 0 |  | s7 |  |  |  |  |  |  |  | s8 | s9 |  |  |  |  |  |  |  |  |  |  | 1 | 2 | 3 | 4 | 5 | 6 |  |  |  |  |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | accept |  |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | r1 |  |  |  |  |  |  |  |  |  |  |  |
| 3 | s10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | r4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | r5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | r6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  | s11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |  | s12 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |  |  |  | s13 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 |  | s7 |  |  |  |  |  |  |  | s8 | s9 |  |  |  | r2 |  |  |  |  | r2 |  |  | 14 | 3 | 4 | 5 | 6 |  |  |  |  |
| 11 |  |  |  | s15 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 |  |  | s17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 16 |  |  |  |
| 13 |  |  | s17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 18 |  |  |  |
| 14 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | r3 |  |  |  |  | r3 |  |  |  |  |  |  |  |  |  |  |  |
| 15 |  |  | s23 |  |  |  |  |  | s22 |  |  | s24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 19 | 20 | 21 |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  | s25 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s26 | s27 | s28 | s29 |  |  |  |  |  |  |  |  |  |  |  |  |
| 18 |  |  |  |  |  |  |  |  |  |  |  |  | s30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 | r7 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 | r16 |  |  |  | s31 | s32 |  |  |  |  |  |  | r16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 21 | r19 |  |  |  | r19 | r19 | s33 | s34 |  |  |  |  | r19 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 22 | r20 |  |  |  | r20 | r20 | r20 | r20 |  |  |  |  | r20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 23 | r21 |  |  |  | r21 | r21 | r21 | r21 |  |  |  |  | r21 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 24 |  |  | s23 |  |  |  |  |  | s22 |  |  | s24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 35 | 20 | 21 |
| 25 |  |  |  |  |  |  |  |  |  |  |  |  |  | s36 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 26 |  |  | s37 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 27 |  |  | s38 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 28 |  |  | s39 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 29 |  |  | s40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  | s41 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 31 |  |  | s23 |  |  |  |  |  | s22 |  |  | s24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 42 | 20 | 21 |
| 32 |  |  | s23 |  |  |  |  |  | s22 |  |  | s24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 43 | 20 | 21 |
| 33 |  |  | s23 |  |  |  |  |  | s22 |  |  | s24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 44 | 21 |
| 34 |  |  | s23 |  |  |  |  |  | s22 |  |  | s24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 45 | 21 |
| 35 |  |  |  |  |  |  |  |  |  |  |  |  | s46 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 36 |  | s7 |  |  |  |  |  |  |  | s8 | s9 |  |  |  |  |  |  |  |  |  |  |  | 47 | 3 | 4 | 5 | 6 |  |  |  |  |
| 37 |  |  |  |  |  |  |  |  |  |  |  |  | r10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 38 |  |  |  |  |  |  |  |  |  |  |  |  | r11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 39 |  |  |  |  |  |  |  |  |  |  |  |  | r12 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |  |  | r13 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 41 |  | s7 |  |  |  |  |  |  |  | s8 | s9 |  |  |  |  |  |  |  |  |  |  |  | 48 | 3 | 4 | 5 | 6 |  |  |  |  |
| 42 | r14 |  |  |  |  |  |  |  |  |  |  |  | r14 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 43 | r15 |  |  |  |  |  |  |  |  |  |  |  | r15 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 44 | r17 |  |  |  | r17 | r17 |  |  |  |  |  |  | r17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 45 | r18 |  |  |  | r18 | r18 |  |  |  |  |  |  | r18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 46 | r22 |  |  |  | r22 | r22 | r22 | r22 |  |  |  |  | r22 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 47 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s49 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 48 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s50 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 49 | r8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 50 | r9 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |