**Final Grammer**

PROG 🡪 GLOBAL\_VARS FUNC\_PREDEFS FUNC\_FULL\_DEFS

GLOBAL\_VARS 🡪 VAR\_DEC GLOBAL\_VARS\_tag

GLOBAL\_VARS\_tag 🡪 Ɛ | VAR\_DEC GLOBAL\_VARS\_tag

VAR\_DEC 🡪 TYPE id VAR\_DEC\_tag

VAR\_DEC\_tag 🡪 ; | [ DIM\_SIZES ] ;

TYPE 🡪 int | float

DIM\_SIZES 🡪 int\_num DIM\_SIZES\_tag

DIM\_SIZES\_tag 🡪 Ɛ | , int\_num DIM\_SIZES\_tag

FUNC\_PREDEFS 🡪 FUNC\_PROTOTYPE; FUNC\_PREDEFS\_tag

FUNC\_PREDEFS\_tag 🡪 Ɛ | FUNC\_PROTOTYPE ; FUNC\_PREDEFS\_tag

FUNC\_PROTOTYPE 🡪 RETURNED\_TYPE id (PARAMS)

FUNC\_FULL\_DEFS 🡪 FUNC\_WITH\_BODY FUNC\_FULL\_DEFS\_tag

FUNC\_FULL\_DEFS\_tag 🡪 Ɛ | FUNC\_WITH\_BODY FUNC\_FULL\_DEFS\_tag

FUNC\_WITH\_BODY 🡪 FUNC\_PROTOTYPE COMP\_STMT

RETURNED\_TYPE 🡪 TYPE | void

PARAMS 🡪 PARAMS\_LIST | Ɛ

PARAMS\_LIST 🡪 PARAM PARAMS\_LIST\_tag

PARAMS\_LIST\_tag 🡪 Ɛ |, PARAM PARAMS\_LIST\_tag

PARAM 🡪 TYPE id PARAM\_tag

PARAM\_tag 🡪 Ɛ | [DIM\_SIZES]

COMP\_STMT 🡪 {VAR\_DEC\_LIST STMT\_LIST}

VAR\_DEC\_LIST 🡪 Ɛ | VAR\_DEC VAR\_DEC\_LIST

STMT\_LIST 🡪 STMT STMT\_LIST\_tag

STMT\_LIST\_tag 🡪 Ɛ |; STMT STMT\_LIST\_tag

STMT 🡪 COMP\_STMT | if (CONDITION) STMT | RETURN\_STMT | id STMT\_tag

STMT\_tag 🡪 VAR\_tag = EXPR | (ARGS)

IF\_STMT 🡪 if (CONDITION) STMT

CALL 🡪 id (ARGS)

ARGS 🡪 ARG\_LIST | Ɛ

ARG\_LIST 🡪 EXPR ARG\_LIST\_tag

ARG\_LIST\_tag 🡪Ɛ |, EXPR ARG\_LIST\_tag

RETURN\_STMT 🡪 return RETURN\_STMT\_tag

RETURN\_STMT\_tag 🡪 Ɛ | EXPR

VAR 🡪 id VAR\_tag

VAR\_tag 🡪 Ɛ | [EXPR\_LIST]

EXPR\_LIST 🡪 EXPR EXPR\_LIST\_tag

EXPR\_LIST\_tag 🡪Ɛ |, EXPR EXPR\_LIST\_tag

CONDITION 🡪 EXPR rel\_op EXPR

EXPR 🡪 TERM EXPR\_tag

EXPR\_tag 🡪 Ɛ | + TERM EXPR\_tag

TERM 🡪 FACTOR TERM\_tag

TERM\_tag 🡪 Ɛ | \* FACTOR TERM\_tag

FACTOR 🡪 int\_num | float\_num | (EXPR) | id FACTOR\_tag

FACTOR\_tag 🡪 VAR\_tag | (ARGS)

**Nullable, First, Follow Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Name** | **NULLABLE** | **FIRST** | **FOLLOW** |
|  | PROG | **-** | int float | $ |
|  | GLOBAL\_VARS | **-** | int float | int float void |
|  | GLOBAL\_VARS\_tag | **+** | int float | int float void |
|  | VAR\_DEC | **-** | int float | id { if return int float void |
|  | VAR\_DEC\_tag | **-** | ; [ | id { if return int float void |
|  | TYPE | **-** | int float | id |
|  | DIM\_SIZES | **-** | int\_num | ] |
|  | DIM\_SIZES\_tag | **+** | , | ] |
|  | FUNC\_PREDEFS | **-** | int float void | int float void |
|  | FUNC\_PREDEFS\_tag | **+** | int float void | int float void |
|  | FUNC\_PROTOTYPE | **-** | int float void | ; { |
|  | FUNC\_FULL\_DEFS | **-** | int float void | $ |
|  | FUNC\_FULL\_DEFS\_tag | **+** | int float void | $ |
|  | FUNC\_WITH\_BODY | **-** | int float void | int float void $ |
|  | RETURNED\_TYPE | **-** | int float void | id |
|  | PARAMS | **+** | int float | ) |
|  | PARAMS\_LIST | **-** | int float | ) |
|  | PARAMS\_LIST\_tag | **+** | , | ) |
|  | PARAM | **-** | int float | , ) |
|  | PARAM\_tag | **+** | [ | , ) |
|  | COMP\_STMT | **-** | { | int float void $ ; } |
|  | VAR\_DEC\_LIST | **+** | int float | id { if return |
|  | STMT\_LIST | **-** | id { if return | } |
|  | STMT\_LIST\_tag | **+** | ; | } |
|  | STMT | **-** | id { if return | ; } |
|  | STMT\_tag | **-** | ( = [ | ; } |
|  | IF\_STMT | **-** | if |  |
|  | CALL | **-** | id |  |
|  | ARGS | **+** | int\_num float\_num ( id | ) |
|  | ARG\_LIST | **-** | int\_num float\_num ( id | ) |
|  | ARG\_LIST\_tag | **+** | , | ) |
|  | RETURN\_STMT | **-** | return | ; } |
|  | RETURN\_STMT\_tag | **+** | int\_num float\_num ( id | ; } |
|  | VAR | **-** | id |  |
|  | VAR\_tag | **+** | [ | = \* + , ) ; } ] rel\_op |
|  | EXPR\_LIST | **-** | int\_num float\_num ( id | ] |
|  | EXPR\_LIST\_tag | **+** | , | ] |
|  | CONDITION | **-** | int\_num float\_num ( id | ) |
|  | EXPR | **-** | int\_num float\_num ( id | , ) ; } ] rel\_op |
|  | EXPR\_tag | **+** | + | , ) ; } ] rel\_op |
|  | TERM | **-** | int\_num float\_num ( id | + , ) ; } ] rel\_op |
|  | TERM\_tag | **+** | \* | + , ) ; } ] rel\_op |
|  | FACTOR | **-** | int\_num float\_num ( id | \* + , ) ; } ] rel\_op |
|  | FACTOR\_tag | **+** | ( [ | \* + , ) ; } ] rel\_op |