**Grammar after Following Function:**

* Removing Ambiguity
* Removing Left Recursion
* Left Factoring

|  |  |
| --- | --- |
| **S.No** | **Grammar** |
|  | Function 🡪 Type identifier ( ArgList ) CompoundStmt |
|  | ArgList 🡪 ARG Arglist’ |
|  | Arglist’ 🡪 ,ARG Arglist’ |
|  | Arglist’ 🡪 ε |
|  | Arg 🡪type identifier |
|  | Declaration 🡪type identlist ; |
|  | Type 🡪 int |
|  | Type 🡪float |
|  | Identilist 🡪identifier identifierlist’ |
|  | Identifierlist’ 🡪,identifier identifierlist’ |
|  | Identifierlist’ 🡪 ε |
|  | Stmt 🡪 Forstmt |
|  | Stmt 🡪 WhileStmt |
|  | Stmt 🡪 Expr ; |
|  | Stmt 🡪 IfStmt |
|  | Stmt 🡪 CompoundStmt |
|  | Stmt 🡪 Declaration |
|  | Stmt 🡪 ; |
|  | ForStmt 🡪 for < Expr ; Boolexpr ; OptExpr > Stmt |
|  | OptExpr 🡪 Expr |
|  | OptExpr 🡪 ε |
|  | WhileStmt 🡪 while < Boolexpr > Stmt |
|  | IfStmt 🡪 if < Boolexpr > Stmt ElsePart |
|  | ElsePart 🡪 else Stmt |
|  | ElsePart 🡪 ε |
|  | CompoundStmt🡪 [ StmtList ] |
|  | StmtList 🡪 Stmt StmtList |
|  | StmtList 🡪 ε |
|  | Expr 🡪 identifier := Expr |
|  | Expr 🡪 Rvalue |
|  | Rvalue 🡪 Mag Rvalue’ |
|  | Rvalue’ 🡪 compare Mag Rvalue’ |
|  | Rvalue’ 🡪 ε |
|  | Compare 🡪 == |
|  | Compare 🡪 < |
|  | Compare 🡪 > |
|  | Compare 🡪 <= |
|  | Compare 🡪 >= |
|  | Compare 🡪 != |
|  | Compare 🡪 <> |
|  | Mag 🡪 Term Mag’ |
|  | Mag’ 🡪 + Term Mag’ |
|  | Mag’ 🡪 - Term Mag’ |
|  | Mag’ 🡪 ε |
|  | Term 🡪 factor Term’ |
|  | Term’ 🡪 \* factor Term’ |
|  | Term’ 🡪 / factor Term’ |
|  | Term’ 🡪 ε |
|  | Factor 🡪 identifier |
|  | Factor 🡪 Number |
|  | Factor 🡪 (Expr) |
|  | Boolexpr -> identifier Compare Mag |

//added boolExpr grammer

**First and Follow**:

|  |  |  |
| --- | --- | --- |
| **Non Terminals** | **First** | **Follow** |
| Function | Int , float | $ |
| Arglist | Int , float | ) |
| Arglist’ | “,” ε | ) |
| Arg | Int , float | “,” , ) |
| Declaration | Int , float | For , while ,if , identifier , [ , int , float,  ; , identifier , Number , ( , else |
| Type | Int , float | Identifier |
| Identilist | Identifier | ; |
| Identifierlist’ | “,” , ε | ; |
| Stmt | For , while , identifier , [ , int , float,  ; , identifier , Number , ( | For , while ,if , identifier , [ , ], int , float,  ; , identifier , Number , ( , else |
| ForStmt | For | For , while ,if , identifier , [ , ], int , float,  ; , identifier , Number , ( , else |
| OptExpr | Identifier , Number , ( , ε | ; , > |
| WhileStmt | While | For , while ,if , identifier , [ , ] ,int , float,  ; , identifier , Number , ( , else |
| IfStmt | If | For , while ,if , identifier , [ , ] , int , float,  ; , identifier , Number , ( , else |
| ElsePart | else , ε | For , while ,if , identifier , [ , ] , int , float,  ; , identifier , Number , ( , else |
| CompoundStmt | [ | $ , For , while ,if , identifier , [ , ] , int , float,  ; , identifier , Number , ( , else |
| StmtList | For , while ,if , identifier , [ , int , float,  ; , identifier , Number , ( , ε | ] |
| Expr | Identifier , ( , number | ) , > , ; |
| Rvalue | Identifier ,number , ( | ) , > , ; |
| Rvalue’ | ==,<,> , <= , >= , != , <> , ε | ) , > , ; |
| Comapre | ==,<,> , <= , >= , != , <> | Identifier , Number , ( |
| Mag | Identifier , Number , ( | ==,<,> , <= , >= , != , <> , ) , ; |
| Mag’ | + , - , ε | ==,<,> , <= , >= , != , <> , ) , ; |
| Term | Identifier ,Number , ( | + , - , ==,<,> , <= , >= , != , <> , ) , ; |
| Term’ | \*,/ , ε | + , - , ==,<,> , <= , >= , != , <> , ) , ; |
| Factor | Identifier ,Number , ( | \*, / , + , - , ==,<,> , <= , >= , != , <> , ) , ; |
| boolExpr | Identifier | > |