

$$[\text{Prog}] \rightarrow [\text{GlobalDec}]^* \quad (1)$$

$$[\text{GlobalDec}] \rightarrow \begin{cases} \text{let } \text{ident} = [\text{Expr}]; \\ \text{void } \text{ident}(\text{ident}, *)[\text{Scope}] \\ \text{ret } \text{ident}(\text{ident}, *)[\text{Scope}] \end{cases} \quad (2)$$

$$[\text{Stmt}] \rightarrow \begin{cases} [\text{FuncCall}]; \\ [\text{ReturnStmt}] \\ \text{while}([\text{Expr}])[\text{Stmt}] \\ \text{let } \text{ident} = [\text{Expr}]; \\ \text{if}([\text{Expr}])[\text{Stmt}][\text{IfPred}] \\ [\text{Expr}]; \\ [\text{Scope}] \end{cases} \quad (3)$$

$$[\text{Scope}] \rightarrow \{[\text{Stmt}]^*\} \quad (4)$$

$$[\text{FuncCall}] \rightarrow \text{ident}([\text{Expr}], *) \quad (5)$$

$$[\text{ReturnStmt}] \rightarrow \begin{cases} \text{return}; \\ \text{return } [\text{Expr}]; \end{cases} \quad (6)$$

$$[\text{IfPred}] \rightarrow \begin{cases} \text{else}[\text{Stmt}] \\ \epsilon \end{cases} \quad (7)$$

$$[\text{Expr}] \rightarrow \begin{cases} [\text{Term}] \\ [\text{BinExpr}] \end{cases} \quad (8)$$

$$\begin{aligned}
[\text{BinExpr}] \rightarrow & \left\{ \begin{array}{ll} [\text{Expr}].[\text{Expr}] & \text{prec} = 8 \\ [\text{Expr}]\%[\text{Expr}] & \text{prec} = 7 \\ [\text{Expr}] * [\text{Expr}] & \text{prec} = 7 \\ [\text{Expr}]/[\text{Expr}] & \text{prec} = 7 \\ [\text{Expr}] + [\text{Expr}] & \text{prec} = 6 \\ [\text{Expr}] - [\text{Expr}] & \text{prec} = 6 \\ [\text{Expr}] > [\text{Expr}] & \text{prec} = 5 \\ [\text{Expr}] < [\text{Expr}] & \text{prec} = 5 \\ [\text{Expr}] >= [\text{Expr}] & \text{prec} = 5 \\ [\text{Expr}] <= [\text{Expr}] & \text{prec} = 5 \\ [\text{Expr}]! = [\text{Expr}] & \text{prec} = 4 \\ [\text{Expr}] == [\text{Expr}] & \text{prec} = 4 \\ [\text{Expr}] \wedge [\text{Expr}] & \text{prec} = 3 \\ [\text{Expr}] \&\& [\text{Expr}] & \text{prec} = 2 \\ [\text{Expr}] || [\text{Expr}] & \text{prec} = 1 \\ [\text{Var}] + = [\text{Expr}] & \text{prec} = 0 \\ [\text{Var}] - = [\text{Expr}] & \text{prec} = 0 \\ [\text{Var}] * = [\text{Expr}] & \text{prec} = 0 \\ [\text{Var}] / = [\text{Expr}] & \text{prec} = 0 \\ [\text{Var}] \% = [\text{Expr}] & \text{prec} = 0 \\ [\text{Var}] = [\text{Expr}] & \text{prec} = 0 \end{array} \right. \quad (9)
\end{aligned}$$

$$[\text{Var}] \rightarrow \left\{ \begin{array}{l} \text{ident} \\ \text{ident}[\text{Expr}] \end{array} \right. \quad (10)$$

$$[\text{Term}] \rightarrow \left\{ \begin{array}{l} \text{num\_lit} \\ \text{null} \\ [\text{BoolLit}] \\ [\text{FuncCall}] \\ [\text{UnExpr}] \\ [\text{PostUnExpr}] \\ [[\text{Expr}], *] \\ ([\text{Expr}]) \\ [\text{Var}] \end{array} \right. \quad (11)$$

$$[\text{BoolLit}] \rightarrow \left\{ \begin{array}{l} \text{true} \\ \text{false} \end{array} \right. \quad (12)$$

$$[\text{UnExpr}] \rightarrow \begin{cases} -[\text{Term}] \\ ![\text{Term}] \\ \smile [\text{Term}] \\ - - [\text{Term}] \\ + + [\text{Term}] \end{cases} \quad (13)$$

$$[\text{PostUnExpr}] \rightarrow \begin{cases} [\text{Term}] - - \\ [\text{Term}] + + \end{cases} \quad (14)$$