Syntax

- Variable *shadowing* is **not** allowed. Having a variable with the same name in an inner scope is invalid, unless the variable is first declared in the inner scope.

- You must terminate a statement with a semicolon, *unless* that statement **ends** with a scope.

- Single line comments are denoted by '//' and Multi-line comments are denoted with '/* */'

- You must say **please** or **PLEASE** enough to satisfy the compiler.

Producers

$$[\text{Program}] \rightarrow [\text{Statement}]^*$$

$$[\text{Statement}] \rightarrow \begin{cases} \text{please} \\ \text{PLEASE} \\ \text{exit}([\text{Expr}]); \\ \text{print}([\text{Expr}],^* [\text{Expr}]^*); \\ \text{printn}([\text{Expr}],^* [\text{Expr}]^*); \\ \text{set ID} = [\text{Expr}]; \\ \text{set ID} = [\text{List}]; \\ \text{reset ID} = [\text{Expr}]; \\ \text{if}([\text{Expr}])[\text{Scope}][\text{AfterIf}] \\ \text{while}([\text{Expr}])[\text{Scope}] \\ [\text{Scope}] \end{cases}$$

$$[\text{Scope}] \rightarrow \{[\text{Stmt}]^*\}$$

$$[\text{AfterIf}] \rightarrow \begin{cases} \text{elsif}([\text{Expr}])[\text{Scope}][\text{AfterIf}] \\ \text{else}([\text{Expr}])[\text{Scope}] \\ \epsilon \end{cases}$$

$$[\text{Expr}] \rightarrow \begin{cases} [\text{Term}] \\ [\text{BinaryExpr}] \end{cases}$$

$$[\text{Term}] \rightarrow \begin{cases} \text{int\_lit} \\ \text{ID} \\ ([\text{Expr}]) \\ \text{'char'} \end{cases}$$

$$[\text{ID}] \rightarrow \begin{cases} \text{id\_lit} \\ [\text{ListLocation}] \end{cases}$$

$$[\text{ListLocation}] \rightarrow \text{id\_lit}[\ [\text{Expr}]\ ]$$

$$[\text{BinaryExpr}] \rightarrow \begin{cases} [\text{Expr}] \times [\text{Expr}] & precedence = 2 \\ [\text{Expr}] \div [\text{Expr}] & precedence = 2 \\ [\text{Expr}] \% [\text{Expr}] & precedence = 2 \\ [\text{Expr}] + [\text{Expr}] & precedence = 1 \\ [\text{Expr}] - [\text{Expr}] & precedence = 1 \\ [Expr] \leq [Expr] & precedence = 0 \\ [Expr] \geq [Expr] & precedence = 0 \\ [Expr] > [Expr] & precedence = 0 \\ [Expr] < [Expr] & precedence = 0 \\ [Expr] == [Expr] & precedence = 0 \\ [Expr]\ != [Expr] & precedence = 0 \end{cases}$$

Terminals

$$\text{int\_lit} \rightarrow [0\text{-}9]^*$$
$$\text{char} \rightarrow (\text{int})[0\text{-}9a\text{-}zA\text{-}Z]^1$$
$$\text{id\_lit} \rightarrow [a\text{-}zA\text{-}Z][0\text{-}9a\text{-}zA\text{-}Z]^*$$