CSE4061 – Compiler Design Assignment #1

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Grammar of our programming language:

Start →decls compoundstmt decls → declaration **;** decls | ε declaration → type **ID** | type **\_ID** | type **$ID** type → **int** | **double** | **short** compoundstmt → statements statements → statement statements | ε statement → ifstmt | whilestmt | assignment | compoundstmt | methodCall methodCall → **ID (** optparameters **)** **;** | **\_ID** **(** optparameters **) ;** | **$ID** **(** optparameters **) ;** optparameters → params | ε params → param A’ A’ →  **,** param A’ | ε param → **ID** | **\_ID** | **$ID** | intNumber | doubleNumber | shortNumber ifstmt → **if** **(** booleanExp **) {** statement **} else** **{** statement **}** whilestmt → **while** **(** booleanExp **) {** statement **}** booleanExp → arithmeticExp booleanOp arithmeticExp booleanOp → **<** | **>** | **<=** | **>=** | **==** | **!=** assignment → **ID** **=** arithmeticExp **;** | **ID** **=** unaryExp **;** | **\_ID** **=** arithmeticExp **;** | **\_ID** **=** unaryExp **;** | **$ID** **=** arithmeticExp **;** | **$ID** **=** unaryExp **;** unaryExp → **++ ID** | **++ \_ID** | **++ $ID** arithmeticExp → multexpr B’ B’ → **+** multexpr B’ | **-** multexpr B’ | ε multexpr→ simpleexpr C’ C’ → **\*** simpleexpr C’ | **/** simpleexpr C’ | ε simpleexpr → **ID** | **\_ID** | **$ID** | **intNumber** | **doubleNumber** | **shortNumber** | **(** arithmeticExp **)**

Lexical structure of our programming language:

Keywords: if, else, while, int, double, short

Identifiers: An identifier starts with a letter or underscore or dollar sign and continues with letter or digit. Any of the keywords cannot become identifier. Maximum length of the identifier should be at most 64 characters.

Operator: The followings are operators: + - / \* = == < <= > >= !=

Delimiters: whitespace

Numbers: The numbers are defined as follows:

digit ←0|1|2|3|4|5|6|7|8|9

intNumber ← digit+ (the maximum integer number is 127)

doubleNumber ← digit+ (the maximum integer number is 255)

shortNumber ← digit+ (the maximum integer number is 63)