CSE4061 – Compiler Design New Grammer

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Grammar of our programming language:

Start → decls compoundstmt

decls → declaration ; decls | ε

declaration → type ID

type → int | double | short

compoundstmt → { statements }

statements → statement statements | ε

statement → ifstmt | whilestmt | assignment | compoundstmt | methodCall

methodCall → ID ( optparameters ) ;

optparameters → params | ε

params → param A’

A’ → , param A’ | ε

param → ID | intNumber | doubleNumber | shortNumber

ifstmt → if ( booleanExp ) statement else statement

whilestmt → while ( booleanExp ) statement

booleanExp → arithmeticExp booleanOp arithmeticExp

booleanOp → < | > | <= | >= | == | !=

assignment → ID = arithmeticExp ; | ID = unaryExp ;

unaryExp → ++ID|

arithmeticExp → multexpr B’

B’ → + multexpr B’ | - multexpr B’ | ε

multexpr → simpleexpr C’

C’ → \* simpleexpr C’ | / simpleexpr C’ | ε

simpleexpr → 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)