CS390 Principles of Programming Language

Assignment 3 Part II

Requirements:

Part I: Modify the Java code for the PredictiveParser to accommodate the following changes (highlighted and in bold) to the LL(1) calculator grammar. (Note, these changes require the Scanner modifications from the previous Part I of Assignment 3).

```
program → stm_list $$
stmt_list → stmt stmt_list | ε
stmt → [id idTail ; | read id ; | write expr ; | declaraton ;
idTail → := expr | (id );
declaration → int id | bool id
expr → term term_tail
term_tail → add_op term term_tail | ε
term → factor factor_tail
factor_tail → mult_op factor factor_tail | ε
factor → ( expr ) | !expr | id | number  | true  | false
add_op → + | -
mult_op → * | /
```

These changes modify the parser to include:

- add true and false alternate right-side productions to the *factor* production
- add "int id;" and "bool id;" alternatives to the *stmt* production
- add a semi-colon that ends each alternative *stmt* production
- add the *declarations* production
- add a "! *expr*" alternative production to the *factor* production
- add a new idTail production that handles assignment or a function call
- modify the *stmt* production to use the new idTail production

Make sure the Parse Tree is correctly constructed and displays

Part II: What would it take to modify your Scanner and Parser to handle multiple function *definitions* within the program, in which a function cannot be defined within a function. Describe the necessary changes to the grammar, the Scanner, and the parser.

Submission:

Submit your Part II NetBeans project <yourName_Assignment_3II> to the Assignment 3:II Dropbox in the Worldclass course shell associated with your current CS390 Section. (Although you will not earn points for testing, you should appropriately test your code for all requirements). Also submit your Part II answer, as a Microsoft Word document to the Assignment 3:II drop box.

Assignment 3: Part II Rubric

Assignment	**Exemplary**	**Advanced**	**Proficient**	**Not Demonstrated or Major Issues**
Factor: **true | false**			Correctly handles true and false	
Declarations bool and int			Correctly handles new statements	
Stmt **:Semicolons**			Additional keywords correctly scanned	
Stmt: **Unary Operator**			Additional unary Operator correctly scanned	
Stmt: **Function Call**		Alternate production function and parsing correct		
Parse Tree			All parse tree updates correct	
Part II: Function Defs	Appropriately modifications for new grammar	Correctly defines grammar.		
Deductions	Submitted on time Appropriately commented Compiles correctly	Inappropriate comments 1-10%	3% deducted per day late	**Not** submitted within six days of due date or **does not** compile