Bangladesh Agricultural University

Department of Bioinformatics Engineering

Course Code & Title: CSM 3222 Compiler Lab

Level-3, Semester-2, July-December/2024

Deadline: 28 January, 2026 11:59 PM Lab 4 Tasks Platform: Google Classroom

This lab assignment focuses on the construction and use of parsers for context-free grammars. Everyone should select a **distinct grammar** of your choice and implement the following tasks. All code should be uploaded to your GitHub repository in the following folders:

- Parser (ANTLR4)
- Parser (Bison)

Please provide the GitHub link in your report. For each task in your report, you must include the following sections:

a) Objective

b) Requirements

c) Installation and Set-up

d) Implementation with GitHub Link

e) Input and Output

f) Working Principles

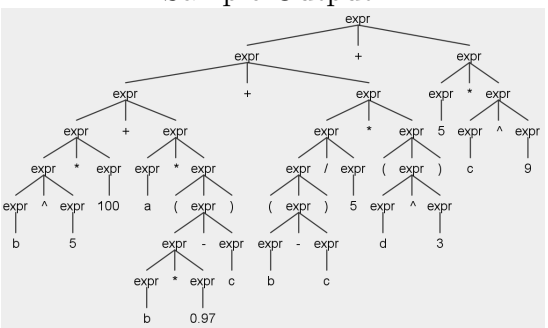
Note: Sample input and outputs are only for demonstration. Input and output will be changed according to your grammar.

Task 1 Use ANTLR4 to generate a lexer and parser for your grammar and visualize its parse tree. The parser should read an input string and check whether it can be generated by the grammar. Demonstrate the parser by parsing at least one string that belongs to your grammar and one that does not.

Sample Input (input.txt):

```
b ^ 5 * 100 + a * (b * 0.97 - c)
    + (b - c) / 5 * (d ^ 3) + 5
  * c ^ 9
```

Sample Output:



Task 2 Design a Flex + Bison program for your context-free grammar. Use Flex to define the tokens and Bison to define the parser rules. Your program should read an input string, check whether it can be generated by your grammar, and report success or syntax errors. Test it with at least one valid and one invalid input string.

Sample Input (input.txt):

```
x = y/5;
if (a) {
    if(a<b){
        m = 5;
    }else{
        m = 10;
    }
}else{
    x = y + z;
}
```

Sample Output:

```
Parsing successful!
```