Assignment 3

Due Date: March 20th, 2019

(No late submissions will be accepted)

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# **General Instructions**

Each assignment has a written part and a programming part. For a written part, please write your answers in a pdf file, and for a programming part, follow the instructions below:

* Write your code in submission.cpp
* TA will test your code with Visual Studio on Windows OS, so please write your code in the same environment.
* Obviously, you must NOT use a library like the Standard Template Library (STL)
* Submit only C ++ files, not the entire project
* You should modify the code in submission.cpp between

**/\* BEGIN\_YOUR\_CODE \*/**

and

**/\* END\_YOUR\_CODE \*/**

You can add other helper functions outside this block if you want.

# **Written Problems**

Do the following problems in the textbook and note that you need to show your work (i.e., not just the answer) for exercises.

**Problem 1 [3 points]**

Do the exercise *R-5.6* in the textbook.

**Problem 2 [2 points]**

Do the exercise *R-5.10* in the textbook.

**Problem 3 [2 points]**

Do the exercise C*-5.1* in the textbook.

**Problem 4 [3 points]**

Do the exercise C*-5.2* in the textbook.

**Problem 5 [2 points]**

Do the exercise C*-5.5* in the textbook.

# **Programming Problems**

**Problem 1. Matching Parentheses**

An important problem in processing arithmetic expression is to make sure their grouping symbols match up correctly. Arithmetic expressions can contain various pairs of grouping symbols, such as

* Parentheses: “(” and “)”
* Braces: “{” and “}”
* Brackets: “[” and “]”

and each opening symbol must match with its corresponding closing symbol. There are several examples below:

* Correct: ()(()){[]}
* Correct: ((){[]}[({}())])
* Incorrect: {
* Incorrect: ({{))]

**Problem 1a [3 points]**

Implement a code that returns matching correctness of arithmetic expressions when the expression is given. (input: arithmetic expression, output: True/False)