

# CS 240: Data Structure

## Problem Set 5

Due: 04/30/2018

### Instructions:

Please follow the instruction given at each problem for submission. The deadline of each assignment is 11:59 pm on the due date, unless otherwise specified. It is important that your code/solution is straight forward, not cumbersome. At the beginning of each cpp file, you must include the following:

- 1. Description:** description of the program (later we will elaborate this more, but for now, just describe what the program does)
- 2. Author:** the person who writes this program
- 3. Date:** the very last date/time the program is modified

This is a bonus problem set. To facilitate the grading, you can email me your code, instead of the TA, for grading. But your email subject line must be **CS240:PS5 Bonus:Your Full Name**. Thanks.

**First Name:**

**Last Name:**

**Score:**        /50

## Problem 1 BST Modification

Two parts for this problem. One is the coding that is 35 pts and one is the explanation that is worth 15 points.

### Part I:

Please modify the BST code (with insertion, deletion) uploaded in blackboard to avoid un-necessary recursion calls in the deletion function. It is where they swap the found smallest element of the right subtree element and the matched element. Please figure how this step could have been eliminated. Also, at the bottom of the deletion function, it branches out to search left and right subtrees, which can also be avoided if we know the relation between the value to be removed and the value of current root.

### Part II:

Please explain how and why (like giving concrete example situation) where your code will definitely outperform the given original code.