# WESTERN UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE
LONDON CANADA

*Software Tools and Systems Programming*
(Computer Science 2211a)

*LAB 10*
The week of November 13, 2020

The purpose of this lab is to add functionality to our code on a binary tree linked list. This will build on the code that used in Lab 09.

This lab will add the ability to search a binary linked list and to delete a single node in the binary linked list and then print the binary tree out displaying the value stored and the number representing the position in the binary tree when it was entered.

**PREPARATION:**
Review the class slides on binary trees.
Copy your lab 09 files

**LAB 10:**

**Complete a C library**

The goal is to search the entire binary tree for a specific value and to remove a single node from the tree while maintaining the tree structure. Nodes will have to be maintain their connection after the requested node is deleted.

The concepts explored are binary trees, variable reference, void pointers and pointers.

You will add to the code you created in lab 9's C files and a header file.

The notes and videos will be an aid in completing this lab.

**INSTRUCTIONS:**
Include the files you used in lab 10.

As in lab 10, each node in the binary tree will contains two integer variables. One of these variables will hold a provided integer value and the other will represent the position of when the node was created.

So the first will contain 0 (representing the root), the next will contain 1, then 2, etc. representing the position of that data element when it was inserted in the binary tree.

The program will then prompt the user for a value to search for. This value should be an integer.
You do not have to write code to verify the input was correct. Assume the user will only enter valid integer values.

If the requested value is found the program will display the value and the position of the node the value was found in. If the requested value is not in the tree, the program will display a message informing the user.

Cycle through be requesting a new value to search for until the user enters a zero (0) to signify they are finished searching for values.

The program will then prompt the user for a value to be deleted from the tree. If the value is a member of the tree, the program will display success of removal and withh then print out the contents of the tree in InOrder transversal. If the requested value is not in the tree, the program will display a message informing the user.

Review and use the code in the notes as a guideline to creating your program.

The files in my solution are:
*main.c*
*headers.h*
*utility.c*
*searchBTree.c*
*deleteBTree.c*
*transverse.c*

**Compile and run the code:**

**Required Coding Standards**

All code is to be indented correctly.
Comments at the very beginning (top – first lines) of each file must be:

```
/* CS2211a 2020 */
/* Lab 10 */
/* your name */
/* your student number */
/* your UWO Account Name */
/* Date Completed */
```

**FINISH:**

Submit (upload) your finished work the <Assignments> section of OWL under Lab10.

## Submission Instructions:

Change your current working directory to ~/courses/cs2211a/Labs. Create file YourUserName_lab10.tar.gz and submit this file for lab 10. (For detailed information, please check *CS2211a Lab Submission Guidelines*).