



## **Laboratory Exercise #5 Trees**

### **Objectives:**

At the end of the exercise, the students should be able to:

- ✚ Develop a Java program that creates a binary search tree.
- ✚ Show and perform operations on trees.
- ✚ Apply methods in the development of the program.

### **Activity 1:**

Write a Java program to create a Binary Search Tree to store the integer values. The program should display a menu of choices to operate the Binary Search Tree data structure.

**Menu**  
**BST Tree Operations**

**[ S ] Show**

**[ I ] Insert**

**[ D ] Delete**

**[ T ] Traverse**

**[ Q ] Quit**

**Enter First Letter of Your Choice : \_\_\_\_**

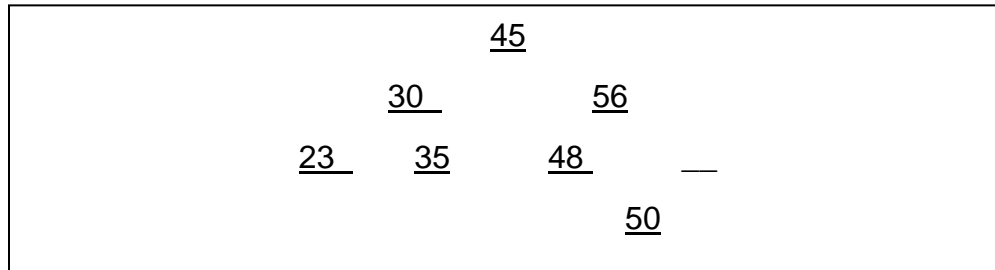
Consider the following in your program:

- The program must ask the user to choose which operation to perform upon executing the program.
- Operations to choose from include; Show, Insert, Delete nodes, and Traversal of the tree.
- When a certain operation is chosen:
  - Show - display the BST
  - Insert - ask a value to insert, no duplication of value is allowed
  - Delete – ask a value to delete, use inorder successor.
  - Traversal - traverse the tree according to the chosen method: Inorder, Preorder, Postorder



- Add other validations you think are necessary in the program.

**If Choice = S or s**



Press any key to continue to go back to the Main Menu

**If Choice = I or i**

Enter Value to Insert : 60

Try Again (Y/N) \_\_\_\_ if Y : Enter Value to Insert  
If N: Back to Main Menu

**If Choice = D or d**

Enter Value to Delete : 35  
35 Successfully Deleted

Try Again (Y/N) \_\_\_\_ if Y : Enter Value to Delete  
If N: Back to Menu

**If Choice = T or t**

Display this menu

**TREE TRAVERSAL**  
**Menu**  
  
1 - InOrder  
2 - PreOrder  
3 - PostOrder  
4 - Exit  
Enter Your Choice : \_\_\_\_



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**If Choice = 1**

Display the InOrder Traversal

Press any key to continue and go back to the Tree Traversal Menu

**If Choice = 2**

Display the PreOrder Traversal

Press any key to continue and go back to the Tree Traversal Menu

**If Choice = 3**

Display the PostOrder Traversal

Press any key to continue and go back to the Tree Traversal Menu

**If Choice = 4**

Go back to the Main Menu

**If Choice = Q or q**

Terminate the program

Make sure to track possible errors in the program. Aside from the given Menu format, you have the freedom to design your output format for the Choices selected.

**Submission Requirements:**

Students must adhere to the following requirements when submitting the laboratory exercises.

1. Every program should follow this File Header requirement. The first lines of the program to be submitted should include comments with the following information and format:

```
/** * A short description of the program.  
 * Group # (Replace # with your group number)  
 * Authors: LastName, FirstName (Leader)  
 *          LastName, FirstName (Members)  
 *          LastName, FirstName  
 * Laboratory Exercise #  
 * Date: (date the program was created)  
 */
```

2. Naming Convention

- a. Program Name or class name should be named following this notation: IT2**X**\_Group#\_Lab# where **X** is your section and **#** is the group and laboratory exercise #. For example, if you belong to BSIT-2A, group #1 and this is laboratory exercise #5, the program name or class name is **IT2A\_Group1\_Lab5** For BSCS-2A class, use CS2A\_Group1\_Lab5.



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- b. For the folder name: **2X-Group#-Lab#** and following the example above, the folder name is **2A-Group1-Lab5**, and for BSCS-2A use 2CS-Group1-Lab5.
3. Test your program several times to make sure it is running correctly, and it is the program you will submit. Only the source program needs to be submitted. Place it in your folder, compress it, and, submit it. The result should be  
**2A-Group1-Lab5.zip**
4. Submit the zipped file using the “Submission Form – Data Structures” intended for your class. The link is already sent/posted in your respective Google classrooms and the same form will be used for every program to be submitted. Only one submission per group is required.
5. The submission date will be announced in your respective class.