University of Central Punjab

Faculty of Information Technology

Data Structures and Algorithms
Spring 2021

Lab 12	
Topic	• Recursion and BST
Objective	• The basic purpose of this lab is to learn and implement BST

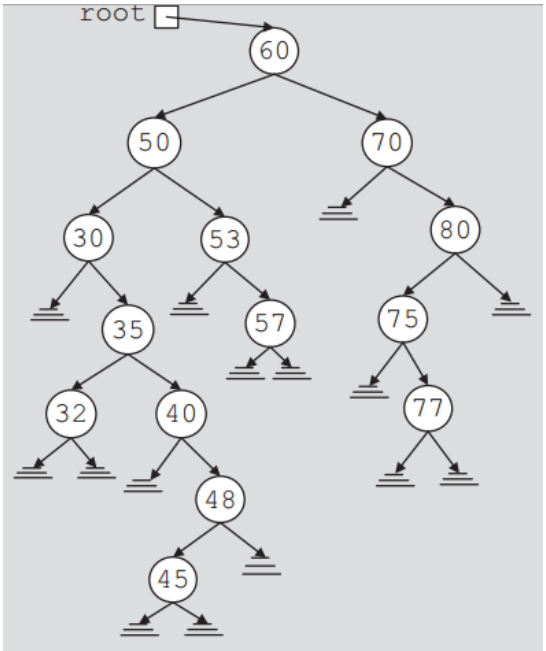
Instructions:

- Indent your code.
- Comment your code.
- Use meaningful variable names.
- Plan your code carefully on a piece of paper before you implement it.
- Name of the program should be same as the task name. i.e. the first program should be Task_1.cpp
- **void main() is not allowed. Use int main()**
- **You have to work in multiple files. i.e separate .h and .cpp files**
- **You are not allowed to use system("pause")**
- **You are not allowed to use any built-in functions**
- **You are required to follow the naming conventions as follow:**
    - **Variables:** firstName; (no underscores allowed)
    - **Function:** getName(); (no underscores allowed)
    - **ClassName:** BankAccount (no underscores allowed)

Students are required to complete the following tasks in lab timings.

Lab Task 1

Write the *recursive* code of **searching** in a BST. Using your recursive insertion code, create the binary tree (given on the right) and search 75, 40 and 1001 in it print the results.



Lab Task 2

Now write three print functions through recursion which prints the tree in task 1 in following orders:

1. Pre-Order
2. In-Order
3. Post-Order

Lab Task 3

Now write a recursive function which prints the height of the BST and test it on the tree made in task1.

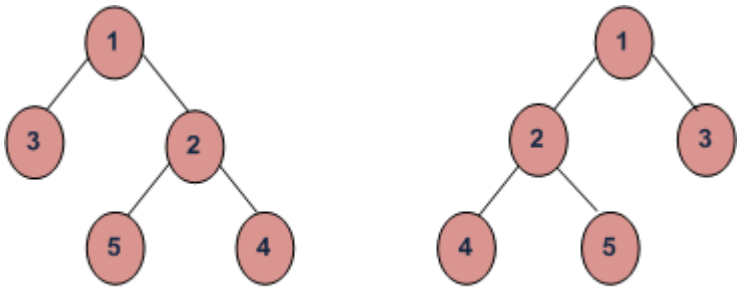
Lab Task 4

Now write a recursive function which counts the leaf nodes of the BST and test it on the tree made in task1.

Lab Task 5

Now write a recursive function which convert a BST into its Mirror Tree, test it on the tree made in task1.

Mirror Tree Example:



Mirror Trees