Data Structures and Algorithms
SE-F22
Lab 10 **Issue Date: May 11, 2024**

Total Marks: 60

Objective:

The objective of this assignment is to solidify our understanding of binary search trees.

Instructions:

1) Follow the question instructions very carefully, no changes in function prototypes are allowed.
2) Anyone caught in an act of plagiarism would be awarded an "F" grade in this Lab.

Task 01(Deletion in BST) [20 Marks]

Prototype:

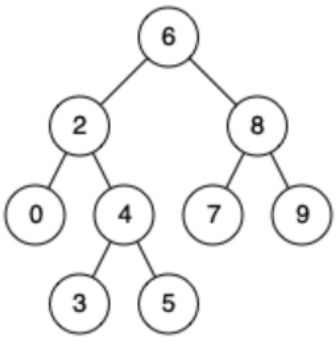
```
void deleteNode(T key);
```

Task 02(Lowest Common Ancestor) [20 Marks]

Given a binary search tree (BST), find the lowest common ancestor (LCA) node of two given nodes in the BST. The lowest common ancestor is defined between two nodes p and q as the lowest node in T that has both p and q as descendants (where we allow a node to be a descendant of itself).

Example 1:

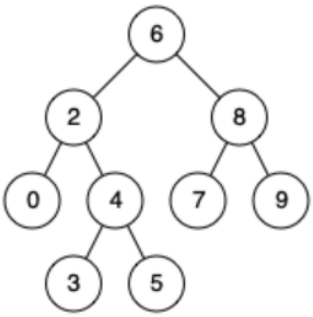
Input: 3 1 4 -1 -1 2 -1



Input: root = [6,2,8,0,4,7,9,null,null,3,5], **p** = 2**, q** = 8

Output: 6

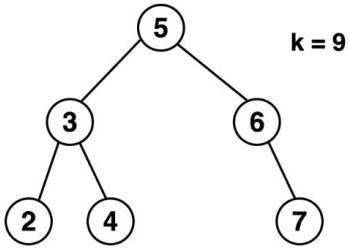
Example 2:



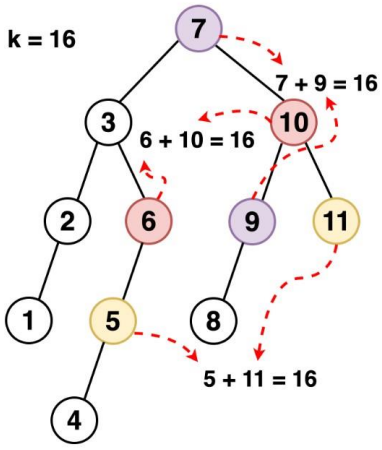
Input: root = [6,2,8,0,4,7,9,null,null,3,5], **p** = 2**, q** = 4 -> **Output:** 2

Task 03(Two Sum in BST) [20 Marks]

Given the root of a Binary Search Tree and an integer k, return true if there exist two elements in the BST such that their sum is equal to k, or false otherwise.



Output: True (6+3 or 7+2 or 5+4)




```
bool findTarget(TreeNode* root, int k)
```

GoodLuck ;)