Assignment 5

Topics:

1. Trees
2. BST
3. Heaps

(Maximum marks -15)

Q-3) Top K Frequent Elements (5 marks)
https://leetcode.com/problems/top-k-frequent-elements/
(5 marks)
(Medium)

Given an integer array nums and an integer k, return *the* k *most frequent elements*. You may return the answer in any order.

Example 1:

Input: nums = [1,1,1,2,2,3], k = 2

Output: [1,2]

Example 2:

Input: nums = [1], k = 1

Output: [1]

Q-2) Lowest Common Ancestor of a Binary Search Tree (5 marks)

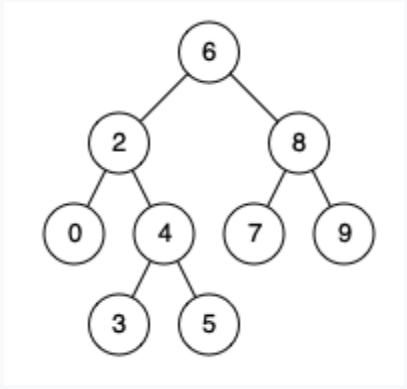
https://leetcode.com/problems/lowest-common-ancestor-of-a-binary-search-tree/

(Easy)

Given a binary search tree (BST), find the lowest common ancestor (LCA) of two given nodes in the BST.

According to the definition of LCA on Wikipedia: “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: root = [6,2,8,0,4,7,9,null,null,3,5], p = 2, q = 8

Output: 6

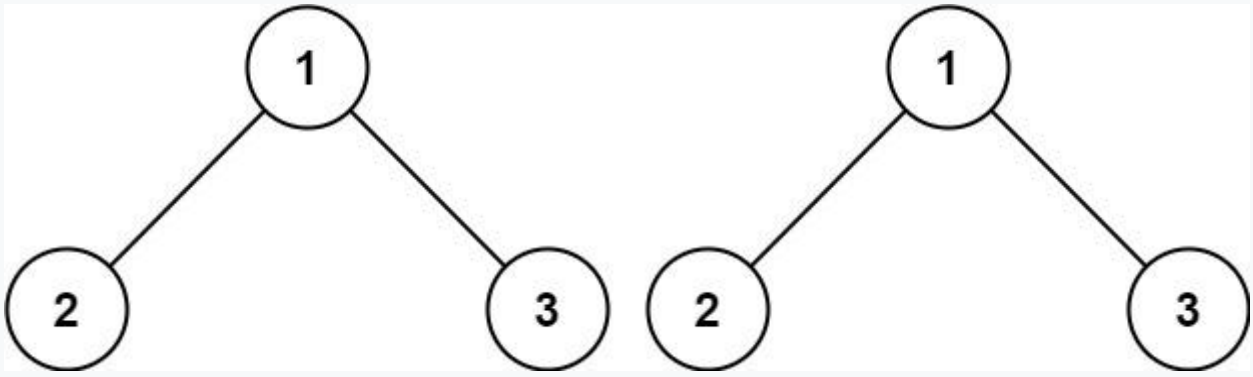
Explanation: The LCA of nodes 2 and 8 is 6.

Q-3) Same Tree (5 marks)
https://leetcode.com/problems/same-tree/

Given the roots of two binary trees p and q, write a function to check if they are the same or not.

Two binary trees are considered the same if they are structurally identical, and the nodes have the same value.

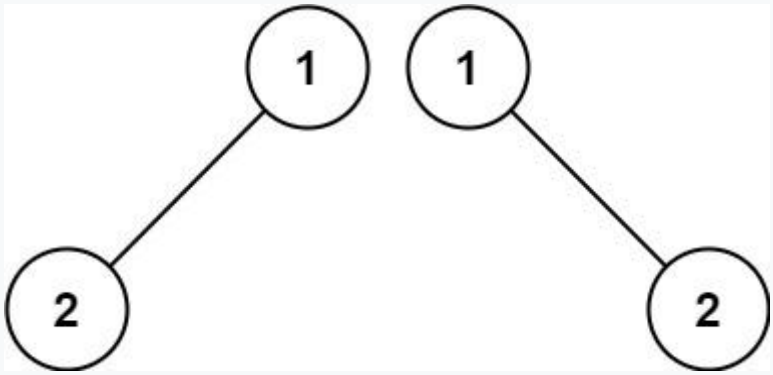
Example 1:



Input: p = [1,2,3], q = [1,2,3]

Output: true

Example 2:



Input: p = [1,2], q = [1,null,2]

Output: false

Q - 4) [BONUS QUESTION] Write a program to compute height of a perfect Binary tree, and explain it's time complexity.(4 marks)

Marks distribution:
Questions 1,2 and 3 carry 5 marks each.

Question 4 is a bonus question, that means if you leave that question you don't lose a mark, but if you solve it, you can get an extra 4 marks.

Remark: maximum marks you can get is 15, bonus question helps only if you are not able to solve another question.