2023-10-21 - Handout – Top Interview Questions

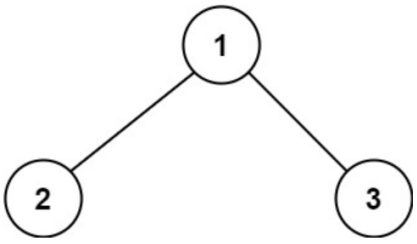
Q1. Binary Tree Maximum Path Sum (Hard, Leetcode #124)

Link: https://leetcode.com/problems/binary-tree-maximum-path-sum/

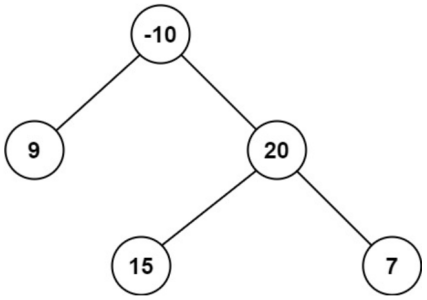
A path in a binary tree is a sequence of nodes where each pair of adjacent nodes in the sequence has an edge connecting them. A node can only appear in the sequence at most once. Note that the path does not need to pass through the root.

The path sum of a path is the sum of the node's values in the path.

Given the root of a binary tree, return the maximum path sum of any non-empty path.



Input: root = [1,2,3]
Output: 6
Explanation: The optimal path is 2 -> 1 -> 3 with a path sum of 2 + 1 + 3 = 6.



Input: root = [-10,9,20,null,null,15,7]
Output: 42
Explanation: The optimal path is 15 -> 20 -> 7 with a path sum of 15 + 20 + 7 = 42.

Q2. Longest Substring With At Most K Distinct Characters (Medium, Leetcode #340)

Link: https://leetcode.com/problems/longest-substring-with-at-most-k-distinct-characters/

Given a string `s` and an integer `k`, return *the length of the longest substring of* `s` *that contains at most* `k` ***distinct*** *characters*.

Example 1:

Input: s = "eceba", k = 2

Output: 3

Explanation: The substring is "ece" with length 3.

Example 2:

Input: s = "aa", k = 1

Output: 2

Explanation: The substring is "aa" with length 2.

Q3. Top K Frequent Elements (Medium, Leetcode #347)

Link: Top K Frequent Elements - LeetCode

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

Example:

Input: nums = [1,1,1,2,2,3], k = 2; **Output:** [1,2]

Q4. Word Break (Medium, Leetcode #139)

Link: [Word Break - LeetCode]

Given a string s and a dictionary of strings wordDict, return true if s can be segmented into a space-separated sequence of one or more dictionary words.

Note that the same word in the dictionary may be reused multiple times in the segmentation.

Input: s = "leetcode", wordDict = ["leet","code"]

Output: true

Explanation: Return true because "leetcode" can be segmented as "leet code".

Example 2:

Input: s = "applepenapple", wordDict = ["apple","pen"]

Output: true

Explanation: Return true because "applepenapple" can be segmented as "apple pen apple".

Note that you are allowed to reuse a dictionary word.

Example 3:

Input: s = "catsandog", wordDict = ["cats","dog","sand","and","cat"]

Output: false

Q5. Merge K Sorted Lists (Leetcode 23, Hard)

https://leetcode.com/problems/merge-k-sorted-lists/)

You are given an array of k linked-lists lists, each linked-list is sorted in ascending order.

Merge all the linked-lists into one sorted linked-list and return it.

Input: lists = [[1,4,5],[1,3,4],[2,6]]

Output: [1,1,2,3,4,4,5,6]

Explanation: The linked-lists are:

[

1->4->5,

1->3->4,

2->6

]

merging them into one sorted list:

1->1->2->3->4->4->5->6