Week 8

Topic: Depth-First Search, DFS

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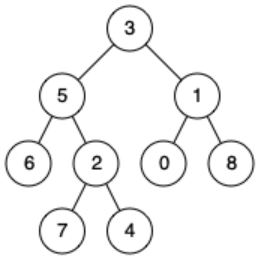
236. Lowest Common Ancestor of a Binary Tree

- Difficulty: Medium
- Problem URL: https://leetcode.com/problems/lowest-common-ancestor-of-a-binary-tree/description/
- Description:
  給定一棵二元樹，和其中的兩個節點 p 和 q，請找出它們的最近共同祖先節點。

Example1:

> Input: root = [3,5,1,6,2,0,8,null,null,7,4], p = 5, q = 1
> Output: 3
> Explanation: The LCA of nodes 5 and 1 is 3.



Example2:

> Input: root = [3,5,1,6,2,0,8,null,null,7,4], p = 5, q = 4
> Output: 5
> Explanation: The LCA of nodes 5 and 4 is 5, since a node can be a descendant of itself according to the LCA definition.

Example3:

> Input: root = [1,2], p = 1, q = 2
> Output: 1

詳細說明與約束條件請參考 Leetcode 網站。

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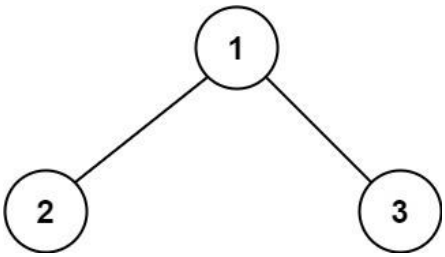
124. Binary Tree Maximum Path Sum

- Difficulty: Hard
- Problem URL: https://leetcode.com/problems/binary-tree-maximum-path-sum/description/
- Description:
  給定一棵二元樹，需要找出該樹中 任意一條路徑的節點值總和最大 的那條路徑，並回傳這個「最大路徑和」的值

Example1:

Input: root = [1,2,3]
Output: 6

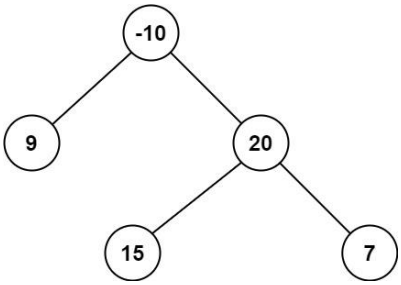
Explanation:
The optimal path is 2 -> 1 -> 3 with a path sum of 2 + 1 + 3 = 6.



Example2:

Input: root = [-10,9,20,null,null,15,7]
Output: 45

Explanation:
The optimal path is 15 -> 20 -> 7 with a path sum of 15 + 20 + 7 = 42.



詳細說明與約束條件請參考 Leetcode 網站。

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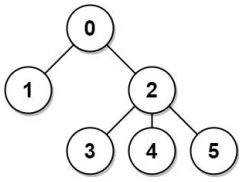
834. Sum of Distances in Tree

- Difficulty: Hard
- Problem URL: https://leetcode.com/problems/sum-of-distances-in-tree/description/
- Description:
  有一棵 無向且連通的樹，包含 n 個節點，節點標號從 0 到 n - 1。這棵樹總共有 n - 1 條邊，每條邊都是一對節點 [a, b]，表示節點 a 和 b 有連接。請你返回一個長度為 n 的整數陣列 answer，其中 answer[i] 是節點 i 到所有其他節點的距離總和。

Example1:

Input: n = 6, edges = [[0,1],[0,2],[2,3],[2,4],[2,5]]
Output: [8,12,6,10,10,10]

Explanation:
The tree is shown above. We can see that dist(0,1) + dist(0,2) + dist(0,3) + dist(0,4) + dist(0,5) equals 1 + 1 + 2 + 2 + 2 = 8. Hence, answer[0] = 8, and so on.

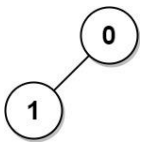


Example2:

Input: n = 1, edges = []
Output: [0]

Example3:

Input: n = 2, edges = [[1,0]]
Output: [1,1]



詳細說明與約束條件請參考 Leetcode 網站。