Graph Theory Workshop

Please ask our helpful programming team if you are confused or stuck! We are happy to help :)

1) **Preorder Printing**

   Print the nodes in a binary tree in DFS order.

   Link: https://leetcode.com/problems/binary-tree-preorder-traversal/

2) **Number of Islands?**

   You are given a grid of m x n tiles, that can be either land or ocean. Find the total number of separate islands on the grid (these islands need to be a group of connected land tiles)

   Link: https://leetcode.com/problems/number-of-islands/

3) **Sum Existence**

   Is there a path from root to leaf in a binary tree that has a sum of node values equal to a target value?

   Link: https://leetcode.com/problems/path-sum/

4) **Network Delay**

   You are given a graph with some internet routers and the time it takes for nearby routers to send a signal to each other. If one router in the network sends a message to all its neighbours, how long would it take for every router in the network to receive the message?

   If the message doesn't reach every router, print `IMPOSSIBLE` instead.

   Link: https://leetcode.com/problems/network-delay-time/

5) **Path of Least Effort**

   You want to move from the top-left cell to the bottom-left cell in a grid, by expending the least effort possible. A path's effort is defined by the maximum difference between 2 cells in the route. What route should you take?

   Link: https://leetcode.com/problems/path-with-minimum-effort/

6) **DP on Tree Graphs**

   Given a binary tree with a value at each node, find the path with the maximum sum of values (a path is defined from one node to another via direct edges, and you can only use each node once).

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