

# GRAPH (DFS)

# Problem - Keys and Rooms

Medium

<https://leetcode.com/problems/keys-and-rooms>

```
int maxProfit(vector<int>& prices) {  
    int profit = 0;  
    int buy = prices[0];  
    for (auto i = 1; i < prices.size(); i++) {  
        if (prices[i] < buy) {  
            buy = prices[i];  
        } else if (prices[i] - buy > profit) {  
            profit = prices[i] - buy;  
        }  
    }  
    return profit;  
}
```

# Problem – Clone Graph

Medium



LeetCode

<https://leetcode.com/problems/clone-graph>

## Problem Statement

- Given a node reference, create a deep copy of the graph
- The class node has two variables: val and neighbours

```
class Node {  
    public int val;  
    public List<Node> neighbors;  
}
```

- **Output** is the node reference of the copy



LeetCode

<https://leetcode.com/problems/clone-graph>

## Solution

- First check the edge cases (is the node null?)
- Create a hash map to store the nodes that is already created  
`unordered<int, Node*> graph;`
- Check if the current node already exists in the graph
- If not, create a new Node object and store in the hashmap
- Visit all the neighbors and add the neighbors to this current node

# Code – Clone Graph

Medium



LeetCode

<https://leetcode.com/problems/clone-graph>

```
std::unordered_map<int, Node*> graph;

Node* cloneGraph(Node* node) {
    if (node == NULL) {
        return NULL;
    }
    // does this node object exists?
    if (graph.find(node->val) == graph.end()) {
        // node wasn't visited yet, store in the hashmap
        graph[node->val] = new Node(node->val);
        // visit all neighbours
        for (const auto& n : node->neighbors) {
            graph[node->val]->neighbors.push_back(cloneGraph(n));
        }
    }
    return graph[node->val];
}
```

# Problem – 207. Course Schedule

Medium



LeetCode

[leetcode.com/problems/course-schedule](https://leetcode.com/problems/course-schedule)

## Problem

■ ...

# Solution – 207. Course Schedule

Medium



LeetCode

[leetcode.com/problems/course-schedule](https://leetcode.com/problems/course-schedule)

## Solution

- ...

# Code – 207. Course Schedule

Medium



LeetCode

[leetcode.com/problems/course-schedule](https://leetcode.com/problems/course-schedule)

**Code** Time:  $O(-)$  Space:  $O(-)$

■ ...



# Problem – 417. Pacific Atlantic Water Flow

Medium



LeetCode

[leetcode.com/problems/pacific-atlantic-water-flow](https://leetcode.com/problems/pacific-atlantic-water-flow)

## Problem

■ ...

# Solution – 417. Pacific Atlantic Water Flow

Medium



LeetCode

[leetcode.com/problems/pacific-atlantic-water-flow](https://leetcode.com/problems/pacific-atlantic-water-flow)

## Solution

- ...

# Code – 417. Pacific Atlantic Water Flow

Medium



LeetCode

[leetcode.com/problems/pacific-atlantic-water-flow](https://leetcode.com/problems/pacific-atlantic-water-flow)

**Code** Time:  $O(-)$  Space:  $O(-)$

■ ...

# Problem – 200. Number of Islands

Medium



LeetCode

[leetcode.com/problems/number-of-islands](https://leetcode.com/problems/number-of-islands)

## Problem

- ...

# Solution – 200. Number of Islands

Medium



LeetCode

[leetcode.com/problems/number-of-islands](https://leetcode.com/problems/number-of-islands)

## Solution

- ...

# Code – 200. Number of Islands

Medium



LeetCode

[leetcode.com/problems/number-of-islands](https://leetcode.com/problems/number-of-islands)

**Code** Time:  $O(-)$  Space:  $O(-)$

■ ...

# Problem – 128. Longest Consecutive Sequence

Medium



LeetCode

[leetcode.com/problems/longest-consecutive-sequence](https://leetcode.com/problems/longest-consecutive-sequence)

## Problem

- ...

# Solution – 128. Longest Consecutive Sequence

Medium



LeetCode

[leetcode.com/problems/longest-consecutive-sequence](https://leetcode.com/problems/longest-consecutive-sequence)

## Solution

- ...



# Code – 128. Longest Consecutive Sequence

Medium



LeetCode

[leetcode.com/problems/longest-consecutive-sequence](https://leetcode.com/problems/longest-consecutive-sequence)

**Code** Time:  $O(-)$  Space:  $O(-)$

■ ...

# Problem – 261. Graph Valid Tree

Medium



LeetCode

[leetcode.com/problems/graph-valid-tree](https://leetcode.com/problems/graph-valid-tree)

## Problem

- ...

# Solution – 261. Graph Valid Tree

Medium



LeetCode

[leetcode.com/problems/graph-valid-tree](https://leetcode.com/problems/graph-valid-tree)

## Solution

- ...

# Code – 261. Graph Valid Tree

Medium



LeetCode

[leetcode.com/problems/graph-valid-tree](https://leetcode.com/problems/graph-valid-tree)

**Code** Time:  $O(-)$  Space:  $O(-)$

■ ...

# Problem – 323. Number of Connected Components

Medium

 [leetcode.com/problems/number-of-connected-components-in-an-undirected-graph](https://leetcode.com/problems/number-of-connected-components-in-an-undirected-graph)

## Problem

- ...

# Problem – 323. Number of Connected Components

Medium

 [leetcode.com/problems/number-of-connected-components-in-an-undirected-graph](https://leetcode.com/problems/number-of-connected-components-in-an-undirected-graph)

## Solution

■ ...

# Problem – 323. Number of Connected Components

Medium

 [leetcode.com/problems/number-of-connected-components-in-an-undirected-graph](https://leetcode.com/problems/number-of-connected-components-in-an-undirected-graph)

**Code** Time:  $O(-)$  Space:  $O(-)$

■ ...