

# GRAPHS

A graph is a non-linear data structure consisting of nodes and edges.

In interviews, graphs are commonly asked for medium and difficult level questions.

Most of the questions will be a variant of Depth First Search (DFS) and Breadth First Search (BFS). A few advanced questions will involve the concept of topological sorting.

BFS uses Queue and DFS uses the concept of Recursion.

Contest will be conducted on 20/06/2020

## Day 1

We'll focus on the core algorithms like BFS, DFS, Dijkstra, Prim and Kruskal's algorithm

### Learning Materials

1. <https://www.geeksforgeeks.org/breadth-first-search-or-bfs-for-a-graph/>
2. <https://www.geeksforgeeks.org/depth-first-search-or-dfs-for-a-graph/?ref=rp>
3. <https://www.youtube.com/watch?v=XB4MlexjvY0>
4. <https://www.youtube.com/watch?v=4ZIRH0eK-qQ>

### Problems

#### Easy:

1. <https://practice.geeksforgeeks.org/problems/depth-first-traversal-for-a-graph/1>
2. <https://practice.geeksforgeeks.org/problems/bfs-traversal-of-graph/1>
3. <https://practice.geeksforgeeks.org/problems/implementing-dijkstra-set-1-adjacency-matrix/1>

#### Medium:

1. <https://leetcode.com/problems/flower-planting-with-no-adjacent>
2. <https://practice.geeksforgeeks.org/problems/detect-cycle-in-an-undirected-graph/1/>

3. <https://practice.geeksforgeeks.org/problems/detect-cycle-in-a-directed-graph/1>

## Day 2

We'll focus on applying BFS and DFS for maze problems

1. <https://www.youtube.com/watch?v=W9F8fDQj7Ok>
2. <https://www.youtube.com/watch?v=hettiSrJjM4>

### Problems

#### Easy

1. <https://practice.geeksforgeeks.org/problems/flood-fill-algorithm/0>
2. <https://practice.geeksforgeeks.org/problems/count-the-paths/0>

#### Medium

1. <https://leetcode.com/problems/keys-and-rooms/>
2. <https://practice.geeksforgeeks.org/problems/length-of-largest-region-of-1s/0>
3. <https://practice.geeksforgeeks.org/problems/x-total-shapes/0>
4. <https://practice.geeksforgeeks.org/problems/find-whether-path-exist/0>

#### Hard

1. <https://practice.geeksforgeeks.org/problems/doctor-strange/0>

## Day 3

#### Easy

1. <https://leetcode.com/problems/employee-importance/>

#### Medium

1. <https://leetcode.com/problems/number-of-islands>
2. <https://leetcode.com/problems/reconstruct-itinerary>
3. <https://leetcode.com/problems/number-of-closed-islands/>

## Day 4

### References

1. Topological Sorting: <https://www.geeksforgeeks.org/topological-sorting-indegree-based-solution/>

### Problems

1. <https://leetcode.com/problems/reconstruct-itinerary>
2. <https://leetcode.com/problems/course-schedule>
3. <https://practice.geeksforgeeks.org/problems/alien-dictionary/1>

## Day 5

Interested people can solve the problems for this day. Please do go through the references. Apart from that you can try to revise the problems that you have worked out till now.

### References

1. Floyd Warshall Algorithm:  
<https://www.youtube.com/watch?v=oNI0rf2P9gE>

### Problems

1. <https://www.hackerrank.com/challenges/the-quickest-way-up/problem>
2. <https://practice.geeksforgeeks.org/problems/implementing-floyd-warshall/0>