

**Introduction to Algorithms**

# **Module 3.5: Practice Day 02**

**(GeeksforGeeks, Leetcode and Practice)**

**Topics:**

1. BFS
2. DFS
3. BFS, DFS on 2D Grid
4. Components

**GeeksforGeeks and Leetcode Links:**

1. [DFS of Graph | Practice | GeeksforGeeks](https://www.geeksforgeeks.org/problems/depth-first-traversal-for-a-graph/1?utm_source=geeksforgeeks&utm_medium=article_practice_tab&utm_campaign=article_practice_tab)
2. [1254. Number of Closed Islands | Leetcode](https://leetcode.com/problems/number-of-closed-islands/)
3. [733. Flood Fill | Leetcode](https://leetcode.com/problems/flood-fill/)

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**Question:** You will be given an undirected graph as input. Then you will be given a node **N**. You need to tell the number of nodes that can be visited from node **N**.

| **Sample Input** | **Sample Output** |
| --- | --- |
| 6 5  0 1  0 2  0 3  2 3  4 5  2 | 4 |
| 6 5  0 1  0 2  0 3  2 3  4 5  4 | 2 |
| 7 6  0 1  1 2  2 3  1 3  4 0  5 6  1 | 5 |

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**Question:** You will be given an undirected graph as input. You need to tell the number of components in this graph.

| **Sample Input** | **Sample Output** |
| --- | --- |
| 6 5  0 1  0 2  0 3  2 3  4 5 | 2 |
| 9 7  0 1  0 2  0 3  2 3  4 5  6 8  7 6 | 3 |
| 7 7  0 1  1 2  2 3  1 3  4 0  0 5  5 6 | 1 |
| 10 5  1 2  2 3  1 3  4 0  5 6 | 6  (Because 7 8 and 9 nodes are not connected, but they are also components) |

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**Question:** You will be given an undirected graph as input. You need to tell the number of nodes in each component in ascending order.

| **Sample Input** | **Sample Output** |
| --- | --- |
| 6 5  0 1  0 2  0 3  2 3  4 5 | 2 4 |
| 9 7  0 1  0 2  0 3  2 3  4 5  6 8  7 6 | 2 3 4 |
| 7 7  0 1  1 2  2 3  1 3  4 0  0 5  5 6 | 7 |
| 10 5  1 2  2 3  1 3  4 0  5 6 | 1 1 1 2 2 3  (Because 7 8 and 9 nodes are not connected, but they are also components) |