

**Introduction to Algorithms**

# **Module 2.5: Practice Day 01**

**(GeeksforGeeks and Practice)**

**Topics:**

1. Graph Representation
2. BFS

**Problem Links:**

1. [Keys and rooms](https://leetcode.com/problems/keys-and-rooms/description/) - LeetCode [Medium]
2. [Message Route](https://cses.fi/problemset/task/1667) - CSES

# 

**Question:** You will be given an undirected graph as input. Then you will be given a query **Q**. For each query, you will be given source **S** and destination **D**. You need to print the shortest distance between S and D. If there is no path from S to D, print **-1**.

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

# 

**Question:** You will be given an undirected graph which will be connected as input. Then you will be given a level **L**. You need to print the node values at level L in descending order. The source will be 0 always.

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

# 

**Question:** You will be given an undirected graph as input. Then you will be given a node **N**. You need to print the number of nodes that are directly connected to the node N.

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