

Introduction to Algorithms

Module 2.5: Practice Day 01

(GeeksforGeeks and Practice)

Topics:

- 1. Graph Representation
- 2. BFS

GeeksforGeeks Links:

1. BFS of graph | Practice | GeeksforGeeks

Practice Problem 1

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 | 2 |
| 0 1 0 2 | 3 |
| 12 | 3 |
| 0 3 4 2 | 2 |
| 3 5 | 2 |
| 4 3 6 | 0 |
| 0 5 | |
| 1 5 2 5 | |
| 2 3 | |
| 1 4 0 0 | |
| 7 5 | -1 |
| 0 1 0 2 | -1 |
| 4 5 | -1 |
| 4 6 5 7 | |
| 3 | |
| 0 4 5 1 | |
| 13 | |

Practice Problem 2

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 |

Practice Problem 3

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 |