

IT LAB(ALGO) - M.TECH CS

Lab-3: Graph Traversal : Due: By Oct 25

October 18, 2021

Implementation of Breadth-First Search(BFS) Algorithm:

Write a program to implement BFS traversal algorithm on a connected, undirected graph. The program should return the BFS tree. Choose the start node randomly. The program should read the input from a file containing the graph as an edge list. And store the graph using 2 data structures (i) adjacency matrix and (ii) adjacency list.

- Requirements:

The program is run using command line arguments with the first argument as the input file name and second argument giving the data structure (1 for matrix and 2 for list) and write the output to the screen.

- For example:

```
./bfs inputgraph.txt 1  
./bfs inputgraph.txt 2
```

- Input file: Input is given in a file with first line containing the number of vertices followed by the graph given as an edge list (one edge per line with the vertices space separated).

```
n  
u v
```

- Output: The BFS tree given as an edge list

- **Example:**

Input:

5
1 2
1 4
1 5
2 3
2 5
3 4
4 5

- **Output:** (suppose 3 is chosen as the source)

3 2
3 4
2 1
4 5