Usman Institute of Technology

Department of Computer Science – Fall 2018

CS-211 Data Structures and Algorithms
Lab Manual

OBJECTIVE:

1. *Understand and implement Graph.*
2. *Understand and Implement Graph Traversal Techniques.*

Name : _____

Roll No. : _____

Semester : _____ Section: _____

Date : _____

Remarks : _____

Signature : _____

Lab 10: Implementation of Graph and its Traversal Techniques

EXERCISES:

a. Create a class Graph in order to implement graph operations and store its elements.

class Graph

b. Declare two properties in the class Graph, NumofNodes for storing number of nodes in the graph and AdjMatrix for storing the connection between vertices.

public int[,] adjMatrix
public int numberOfNodes

c. Create a constructor of class Graph that takes number of nodes as an input argument and initialize AdjMatrix.

public Graph(int numOfNodes)

d. Create a function AddEdge() which sets 1 to the matrix element whose vertices are connected.

public void AddEdge(int source, int destination)

e. Create a function GetNeighbours() which takes a vertex as a parameter and returns the list of all neighbors of that vertex.

public int[] GetNeighbours(int vertex)

f. Create a function PrintMatrix() to print the adjacent matrix.

public void PrintMatrix()

g. Create a function DFS() which performs the Depth First Search in graph.

public void DFS(int source)

h. Create a function BFS() which performs the Depth First Search in graph.

public void BFS(int source)

i. Modify the program and get neighbors of vertices using adjacency list instead of adjacency matrix. An adjacency list represents a graph as an array of linked list. The index of the array represents a vertex and each element in its linked list represents the other vertices that form an edge with the vertex.