Green University of Bangladesh
Department of Computer Science and Engineering (CSE)
Faculty of Sciences and Engineering
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Lab Report NO: 01
Course Title: ALGORITHMS LAB
Course Code: CSE 206   Section: 231 (D2)

Lab Experiment Name: Implement Bread-First Search Traversal

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Lab Report Status
Marks: …………………………………   **Signature:....................**
Comments:...   **Date:.............................**

❖ TITLE OF THE LAB REPORT EXPERIMENT

Implement Bread-First Search Traversal

❖ OBJECTIVES/AIM

To understand how to represent a graph using an adjacency matrix.

To understand how Bread-First Search (BFS) works.

❖ IMPLEMENTATION

Every graph is a set of points referred to as vertices or nodes which are connected using lines called edges.The vertices represent entities in a graph. Edges, on the other hand, express relationships between entities.Hence, while nodes model entities, edges model relationships in a network graph. A graph G with a set of V vertices together with a set of E edges is represented as G= (V, E). Both vertices and edges can have additional attributes that are used to describe the entities and relationships. Figure 1 depicts a simple graph with five nodes and seven edges.
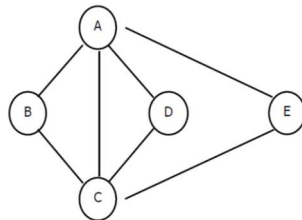
Adjacency Matrix:

Vertices are labeled (or re-labeled) with integers from 0 to V (G) - 1. A two-dimensional array "matrix" with dimensions V (G) * V (G) contains a 1 at matrix [j] [k] if there is an edge from the vertex labeled j to the

vertex labeled k, and a 0 otherwise.Table:1 represents the graph of figure:1;

	A	B	C	D	E
A	0	1	1	1	1
B	1	0	1	0	0
C	1	1	0	1	1
D	1	0	1	0	0
E	1	0	1	0	0

Table: 1

Algorithm (Adjacency Matrix)

Step 1. Set i=0, e = Number of edges.

Step 2. e (number of edge) < i (Decision). • if no - continue with the step 7.

Step 3. Take the values of edge by giving the adjacency nodes [j], [k] (A, B, C, D, E=0,1,2,3,4).

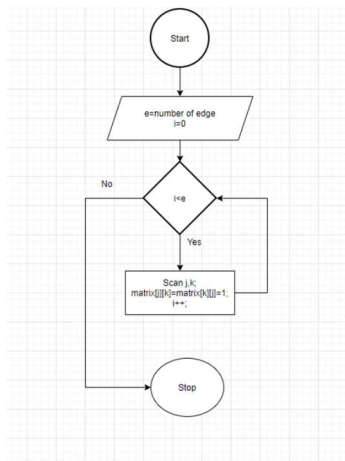Step 4. matrix[j][k] =matrix[k][j] =1.

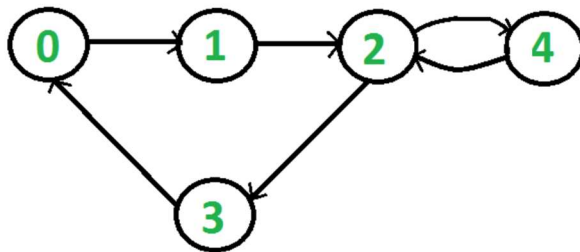Step 5. Increment i (i++).

Step 6. continue with the step 2.

Step 7. Stop.

❖ Flowchart

❖ **Lab Exercise (Submit as a report)**

Write a program to detect the cycle in a graph using BFS.

❖ **ANALYSIS AND DISCUSSION**

Breadth-First Search (BFS) explores graph or tree structures level by level, using a queue to track nodes. Starting from a source node, it visits all its neighbors before moving to the next level. BFS efficiently finds the shortest path in unweighted graphs and supports level-order traversal in trees.