CSC 323 Algorithm Design and Analysis, Spring 2019
Instructor: Dr. Natarajan Meghanathan

### Project 8: Number of Walks of a certain Length between any Two Vertices

Due: April 16th: by 11.59 PM (in Canvas)

In this project, you will implement the matrix multiplication-based solution we saw in class to determine the number of walks of length l between any two vertices.

The walk length is 4 for all students. The graph on which your code has to be tested is assigned below.

You are given a startup code (in C++/Java) that reads in the list of edges and sets up the adjacency matrix as a two-dimensional array. Your task would be to extend the code such that the procedure to compute the number of walks of length l is implemented. For ease of implementation, vertex ID starts with 0.

Below, I show the list of edges (stored as a text file) and a screenshot of the expected output for a sample graph.

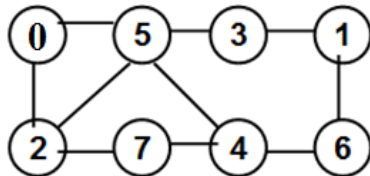| 0	1
0	5
1	2
1	3
1	4
1	5
2	3
3	4
4	5

Sample Graph
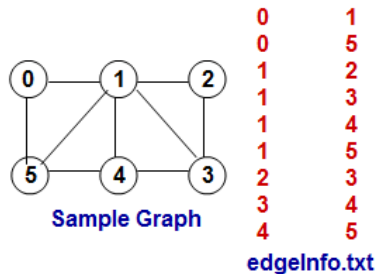
edgeInfo.txt

```
Enter the file name for the edges of the graph: edgeInfo.txt
Enter number of nodes: 6
Enter the walk length: 4
Initial Adjacency Matrix
0 1 0 0 0 1
1 0 1 1 1 1
0 1 0 1 0 0
0 1 1 0 1 0
0 1 0 1 0 1
1 1 0 0 1 0
Final Walk Length Matrix (Length (Length 4)
12 16 11 12 16 12
16 39 16 24 24 24
11 16 12 12 16 12
12 24 12 20 16 19
16 24 16 16 23 16
12 24 12 19 16 20
```
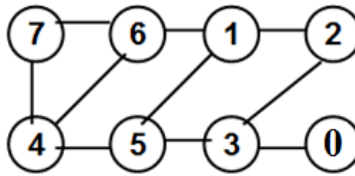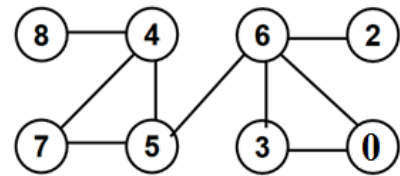
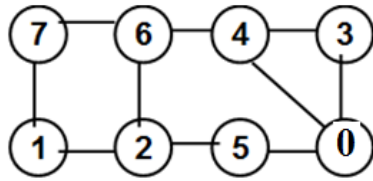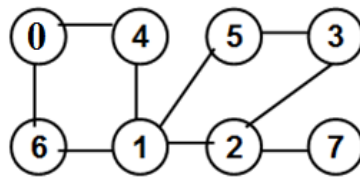## Graph Assigned for each Student

Brown, Demetrius

Cato, Jahelle

Chukwuma, Nzefili

Clark, Armon
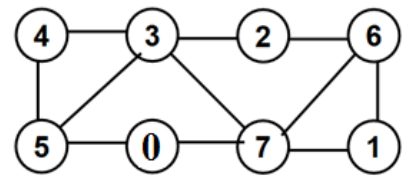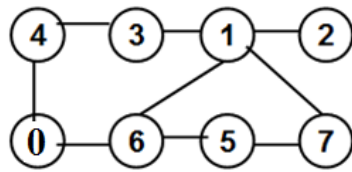
7 6 4 3
1 2 5 0

Collins, Taylor

0 4 5 3
6 1 2 7

Harmon, Alfred

4 3 2 6
5 0 7 1

Jackson, Martice

4 3 1 2
0 6 5 7

Langat, Vincent

6 5 1 2
3 4 7 0

Stewart, Jessica

0 6 5 1
7 4 3 2

Tchakoua, Astride

4 3 1 2
0 6 5 7

Washington, Daren

6 5 1 2
3 4 7 0

Wynn, Marcus

0 6 5 1
7 4 3 2

6 1 5 4
7 2 3 0

0 4 3 1
6 5 7 2

0 4 5 3
6 1 2 7

1 2 7 0
5 6 3 4

0 1 5 6
2 7 4 3
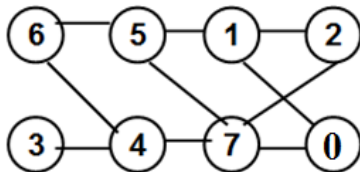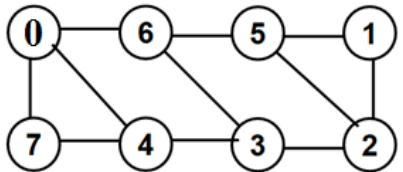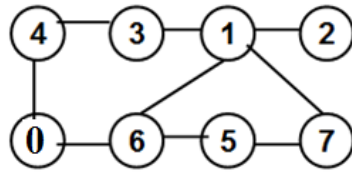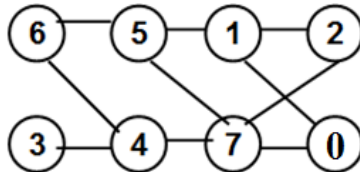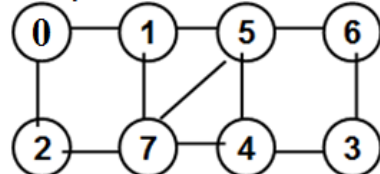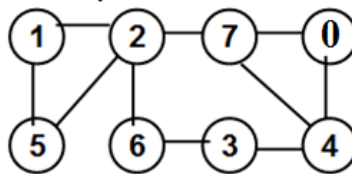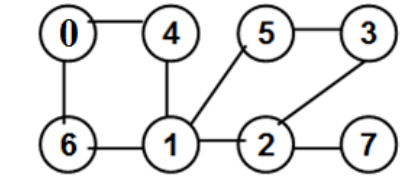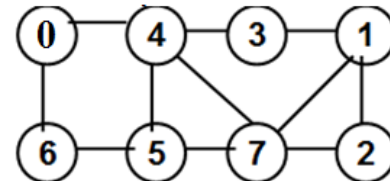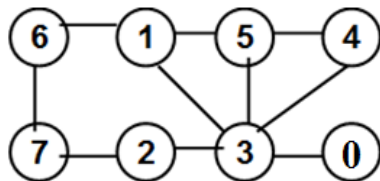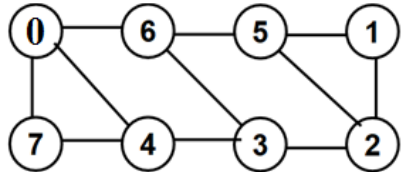
WHAT TO SUBMIT

(submit as a Word or PDF file in Canvas)

1) C++ or Java code of the entire project
2) Screenshot of the output for the graph assigned to you and the walk length of 4.