**CSC 2720 - Data Structures: Lab 12**

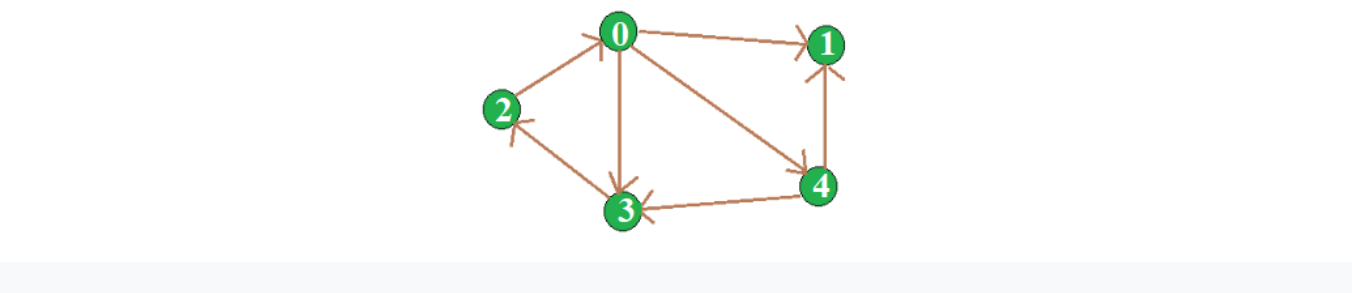
**Deadline to Submit: [4/09/2021] [11:00pm] ET(US)**

Failure to submit will result in a zero for this lab.

**Problem: [100 points]**

Given the adjacency list representation of a graph, write a function generateAdjMatrix that generates and returns the adjacency matrix representation of the graph based on the adjacency list. Write another function printMatrix that takes the adjacency matrix input and print it.

**For example:** For the following graph:



Input: Adjacency List:

0:1-->4-->3

1. :
2. : 0
3. : 2

4:3-->1

Output: The adjacency Matrix:

01011

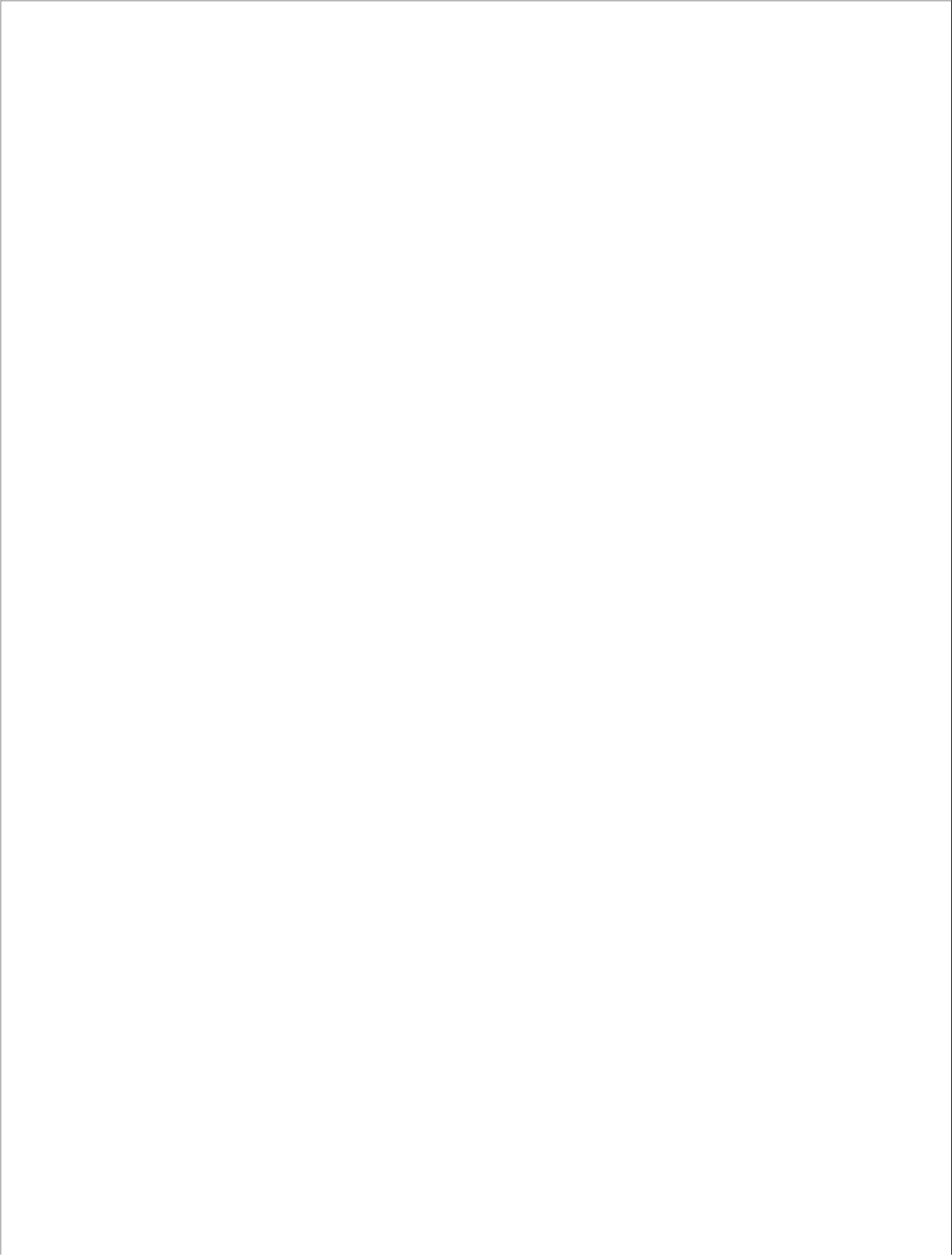
00000

10000

00100

01010



------------------------------------------- Graph Class ------------------------------------------

**import** java.util.LinkedList;

**public class** Graph {

**int** numVertices;

LinkedList<Integer>[] adjacencyList;

Graph(**int** n){

numVertices = n;

adjacencyList = **new** LinkedList[numVertices];

**for**(**int** i=0;i<numVertices;i++)

adjacencyList[i] = **new** LinkedList<Integer>();

}

**void** addEdge(Integersrc, Integerdes){

**this**.adjacencyList[src].add(des);

}

**void** printGraph(){

**for**(**int** i=0;i<**this**.numVertices;i++){//System.out.println("Adjacency list of vertex : " + i); System.***out***.print(""+i+" : ");

**int** j=0;

**for**(;j<**this**.adjacencyList[i].size()-1;j++){

System.***out***.print(**this**.adjacencyList[i].get(j));

System.***out***.print(" --> ");

}

**if**(j==adjacencyList[i].size()-1)

System.***out***.println(**this**.adjacencyList[i].get(j));

**else** System.***out***.println();

}

}

**public static** Integer[][] generateAdjMatrix(){

Integer[][] adjacencyMatrix = **null**;

* INSERT CODE HERE **return** adjacencyMatrix;

}

**public static void** printMatrix(Integer[][]adjMatrix){

// INSERT CODE HERE

}

**public static void** main(String[]args) {

* Create a graph of 5 vertices Graph g2 = **new** Graph(5); g2.addEdge(0, 1); g2.addEdge(0, 4); g2.addEdge(0, 3); g2.addEdge(2, 0); g2.addEdge(3, 2); g2.addEdge(4, 3); g2.addEdge(4, 1); g2.printGraph();

Integer[][] adjMatrix = *generateAdjMatrix*();

*printMatrix*(adjMatrix);

/\* Should print the following Matrix

01011

00000

10000

00100

01010

\*/

}

}

