**Question No 2: Graph connected through java program.**

import java.util.\*;

import java.util.LinkedList;

import java.util.Queue;

import java.util.Scanner;

public class graphConnected

{

private Queue<Integer> queue;

public graphConnected()

{

queue = new LinkedList<Integer>();

}

public void bfs(int adjacency\_matrix[][], int source)

{

int numberofnodes = adjacency\_matrix[source].length - 1;

int[] visited = new int[numberofnodes + 1];

int i, element;

visited[source] = 1;

queue.add(source);

while (!queue.isEmpty())

{

element = queue.remove();

i = element;

while (i <= numberofnodes)

{

if (adjacency\_matrix[element][i] == 1 && visited[i] == 0)

{

queue.add(i);

visited[i] = 1;

}

i++;

}

}

boolean connected = false;

for (int vertex = 1; vertex <= numberofnodes; vertex++)

{

if (visited[vertex] == 1)

{

connected = true;

} else

{

connected = false;

break;

}

}

if (connected)

{

System.out.println("The graph given is connected");

} else

{

System.out.println("The graph given is disconnected");

}

}

public static void main(String... arg)

{

int number\_no\_nodes, source;

Scanner scanner = null;

try

{

System.out.println("Enter the number of nodes in the graph");

scanner = new Scanner(System.in);

number\_no\_nodes = scanner.nextInt();

int adjacency\_matrix[][] = new int[number\_no\_nodes + 1][number\_no\_nodes + 1];

System.out.println("Enter the adjacency matrix");

for (int i = 1; i <= number\_no\_nodes; i++)

for (int j = 1; j <= number\_no\_nodes; j++)

adjacency\_matrix[i][j] = scanner.nextInt();

for (int i = 1; i <= number\_no\_nodes; i++)

{

for (int j = 1; j <= number\_no\_nodes; j++)

{

if (adjacency\_matrix[i][j] == 1 && adjacency\_matrix[j][i] == 0)

{

adjacency\_matrix[j][i] = 1;

}

}

}

System.out.println("Enter the source for the graph");

source = scanner.nextInt();

graphConnected undirectedConnectivity= new graphConnected();

undirectedConnectivity.bfs(adjacency\_matrix, source);

} catch (InputMismatchException inputMismatch)

{

System.out.println("Wrong Input Format");

}

scanner.close();

}

}