Design Analysis and Algorithm Lab

M.C.A.-Semester-I

Session:Winter 2024 (2024-2025)

Ramdeobaba University, Nagpur

Department of Computer Science and Application

MCA(Artificial Intelligence and Machine Learning)

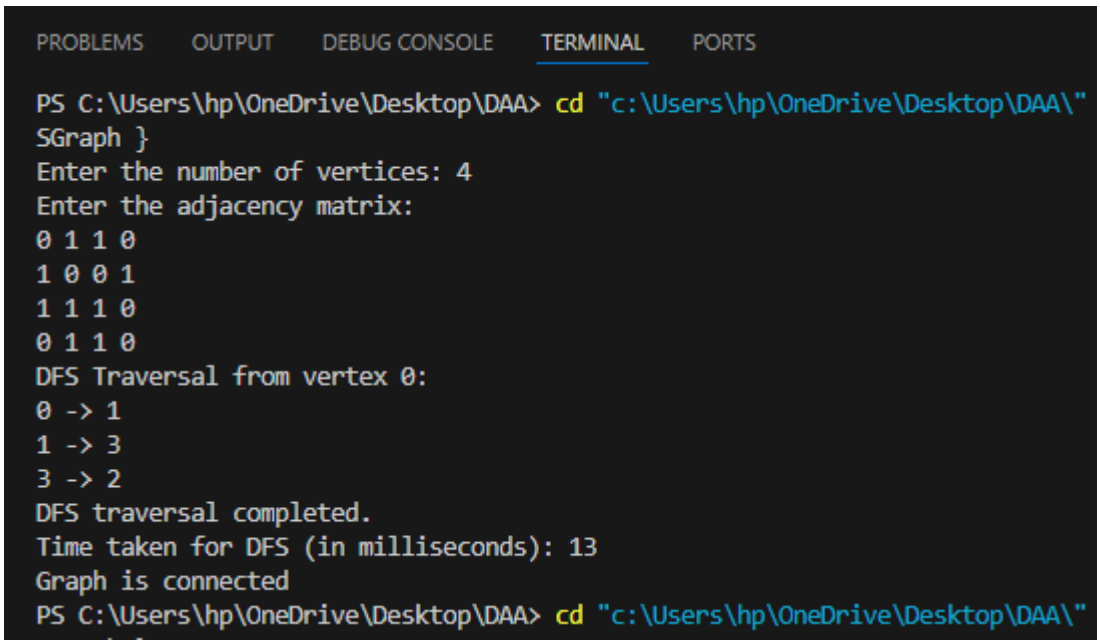
Name of Program: Implementation of Depth First Search on a Graph and show its running time to perform the search.

Source Code:

```
import java.util.Scanner;


public class DFSGraph {
   static int[][] a = new int[20][20];
   static boolean[] reach = new boolean[20];
   static int n;

   // DFS function to visit nodes
   static void dfs(int v) {
      reach[v] = true;

      for (int i = 0; i < n; i++) {
         if (a[v][i] == 1 && !reach[i]) {
            System.out.println(v + " -> " + i);
            dfs(i);
         }
      }
   }

   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter the number of vertices: ");
      n = sc.nextInt();
      for (int i = 0; i < n; i++) {
         reach[i] = false;
         for (int j = 0; j < n; j++) {
            a[i][j] = 0;
         }
```

```
        }

        System.out.println("Enter the adjacency matrix:");
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < n; j++) {
                a[i][j] = sc.nextInt();
            }
        }
        long startTime = System.currentTimeMillis();
        System.out.println("DFS Traversal from vertex 0:");
        dfs(0);

        long endTime = System.currentTimeMillis();
        long duration = endTime - startTime;

        System.out.println("DFS traversal completed.");

        System.out.println("Time taken for DFS (in milliseconds): " + duration);
        int count = 0;
        for (int i = 0; i < n; i++) {
            if (reach[i]) {
                count++;
            }
        }
        if (count == n) {
            System.out.println("Graph is connected");
        } else {
            System.out.println("Graph is not connected");
        }
        sc.close();
    }
}
```

Output:



Submitted By:

Ritu Choudhary

Roll no:51

MCA(AI/ML) – Section B