Write a program to implement DFS Using JAVA

Lab Assignment-8

CSE3002 : Artificial Intelligence

Submitted by:

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Under the Guidance of

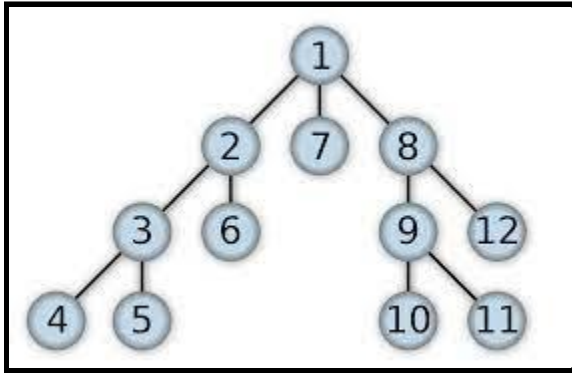**Prof. Manomita Chakraborty**

SCOPE

VIT-AP

Task:

Write a program to implement DFS (Depth-first search)

Solution:

I have used OOPs, ArrayList, and recursion to implement DFS using Java

This is the graph used as a testcase for DFS.

Below is the source code of the same.

```java
import java.util.*;
class lab8{
static class Edge{
    int src;
    int nbr;
    public Edge(int s,int d){
        src=s;
        nbr=d;
    }
}
    public static void main(String [] args){
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter number of vertices");
        int v=sc.nextInt();
        ArrayList<Edge>[] graph=new ArrayList[v];
        for(int i=0;i<v;i++){
            graph[i]=new ArrayList<>();
        }
        System.out.println("Enter number of edges");
        int e=sc.nextInt();
        System.out.println("Enter Each edge ");
```

```java
        for(int i=0;i<e;i++){
            System.out.print("Edge "+(i+1)+" : ");
            int s=sc.nextInt()-1;
            int d=sc.nextInt()-1;
            graph[s].add(new Edge(s,d));
            graph[d].add(new Edge(d,s));
        }
        boolean []vis=new boolean[v];
        System.out.println("Enter source and goal vertex");
        int src=sc.nextInt()-1;
        int goal=sc.nextInt()-1;
        asf=""+(src+1);
        DFS(src,goal,graph,vis);
    }
    static String asf;
    public static void DFS(int src,int goal,ArrayList<Edge> []
graph,boolean [] vis){
        if(src==goal){
            System.out.println("DFS Path to reach goal : "+asf);
            return;
        }
        vis[src]=true;
        for(Edge e:graph[src]){
            int nbr=e.nbr;
            if(vis[nbr]==false){
                asf+="->"+(nbr+1);
                DFS(nbr,goal,graph,vis);
            }
        }
    }
}
```

Output below :

```java
                asf= +(src+1);
                DFS(src,goal,graph,vis);
        }
        static String asf;
        public static void DFS(int src,int goal,ArrayList<Edge> [] graph,boolean [] vis){
                if(src==goal){
                        System.out.println("DFS Path to reach goal : "+asf);
                        return;
                }
                vis[src]=true;
                for(Edge e:graph[src]){
                        int nbr=e.nbr;
                        if(vis[nbr]==false){
```

Enter number of vertices
12
Enter number of edges
11
Enter Each edge
Edge 1 : 1 2
Edge 2 : 1 7
Edge 3 : 1 8
Edge 4 : 2 3
Edge 5 : 2 6
Edge 6 : 3 4
Edge 7 : 3 5
Edge 8 : 8 9
Edge 9 : 8 12
Edge 10 : 9 10
Edge 11 : 9 11
Enter source and goal vertex
1 8
DFS Path to reach goal : 1->2->3->4->5->6->7->8
PS C:\Users\MJ HEMANTH KUMAR\Desktop\AI-lab>