



Write a program to implement DFS Using JAVA

Lab Assignment-8

CSE3002 : Artificial Intelligence

Submitted by:

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Under the Guidance of

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SCOPE

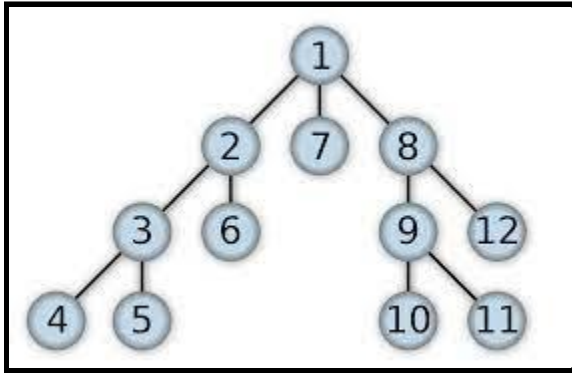
VIT-AP

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.

```
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 ");
```

```

        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 :

File Edit Selection View Go Run Terminal Helplab8.java - AI-lab - Visual Studio Code

EXPLORER

OPEN EDITORS

lab8.java 2

AI-LAB

lab1.java 1

lab2.java 1

lab3.java 2

lab4.java 1

lab5.java 1

lab6.java 1

lab7.java 2

lab8.java 2

lab9.java 1

lab8.java 2

45lab8.java > DFS(int src, ArrayList<Edge>[] graph, boolean[] vis) {
34 int n = graph.length;
35 DFS(src, goal, graph, vis);
36 static String asf;
37 public static void DFS(int src, int goal, ArrayList<Edge>[] graph, boolean[] vis) {
38 if (src == goal) {
39 System.out.println("DFS Path to reach goal : " + asf);
40 return;
41 }
42 vis[src] = true;
43 for (Edge e : graph[src]) {
44 int nbr = e.nbr;
45 if (!vis[nbr]) {

PROBLEMS 12

OUTPUT

TERMINAL

DEBUG CONSOLE

J HEMANTH KUMAR\\.vscode\\extensions\\vscjava.vscode-java-debu
g-0.36.0\\scripts\\launcher.bat" "C:\\Program Files\\Java\\jdk-1
5.0.1\\bin\\java.exe" "-Xc:ShowCodeDetailsInExceptionMessage
s" "-Dfile.encoding=UTF-8" "-cp" "C:\\Users\\MD HEMANTH KUMAR
\\AppData\\Roaming\\Code\\User\\workspaceStorage\\ccba8c3c56c81eb
41834b582c2703fe8\\redhat\\.java\\jdt_vs\\AI-lab_a53219e9\\bin" "
lab8"
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\\MD HEMANTH KUMAR\\Desktop\\AI-lab>

Ln 38, Col 23

Spaces: 4

UTF-8

CRLF

Java

JavaSE-15

Prettier

22:18

27-09-2021

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