**Assignment 1:**

import java.util.Iterator;

import java.util.LinkedList;

import java.util.Scanner;

public class Graph {

int v;

LinkedList<Integer> adj[];

String color[];

int par[];

int dis[];

Graph(int vertex){

v=vertex;

adj= new LinkedList[vertex];

for(int i=0; i<vertex; i++){

adj[i]= new LinkedList();

}

color=new String[vertex];

par= new int[vertex];

dis= new int[vertex];

}

void addEdge(int v, int w){

adj[v].add(w);

}

void BFS(int s, int vertex){

for(int i = 0 ; i < vertex ; i++)

{

if(i!= s)

{

color[i] = "white";

dis[i] = 0;

par[i] = -1;

}

}

color[s]="gray";

dis[s]=0;

par[s]= -1;

LinkedList<Integer> queue = new LinkedList<Integer>();

queue.add(s);

while(queue.size()!= 0){

int u= queue.poll();

System.out.print("-> "+u+" ");

Iterator<Integer> i= adj[u].listIterator();

while (i.hasNext())

{

v=i.next();

if(color[v]== "white")

{

color[v]="gray";

dis[v]=dis[u]+1;

par[v]=u;

queue.add(v);

}

}

color[u]="black";

}

}

public static void main(String args[]){

Graph g = new Graph(4);

g.addEdge(0, 1);

g.addEdge(0, 2);

g.addEdge(1, 2);

g.addEdge(2, 0);

g.addEdge(2, 3);

g.addEdge(3, 3);

System.out.println("Breadth First Traversal starting from vertex 2");

g.BFS(2,4);

}

}

**Assignment 2:**

import java.util.Iterator;

import java.util.LinkedList;

import java.util.Scanner;

import java.util.Stack;

import javax.swing.text.html.HTMLDocument;

public class Graph {

int v;

LinkedList<Integer> adj[];

String color[];

int par[];

int dis[];

int f[];

int time;

Graph(int vertex){

v=vertex;

adj= new LinkedList[vertex];

for(int i=0; i<vertex; i++){

adj[i]= new LinkedList();

}

color=new String[vertex];

par= new int[vertex];

dis= new int[vertex];

f= new int[vertex];

}

void addEdge(int v, int w){

adj[v].add(w);

}

void DFS(){

for(int i=0; i<v; i++){

color[i]="white";

par[i]= -1;

}

time=0;

Stack<Integer> s= new Stack<>();

for(int i=0; i<v; i++){

if(color[i]=="white")

DFS\_visit(i);

}

}

void DFS\_visit(int u){

time= time+1;

dis[u]= time;

color[u]="gray";

System.out.print("-> "+u+" ");

Iterator<Integer> i= adj[u].listIterator();

while(i.hasNext()){

int v= i.next();

if(color[v]=="white"){

par[v]=u;

DFS\_visit(v);

}

color[u]="black";

time=time+1;

f[u]=time;

}

}

public static void main(String args[]){

Graph g = new Graph(4);

g.addEdge(0, 1);

g.addEdge(0, 2);

g.addEdge(1, 2);

g.addEdge(2, 0);

g.addEdge(2, 3);

g.addEdge(3, 3);

System.out.println("Depth First Travarsal: ");

g.DFS();

}

}