PROGRAM 22:

DEPTH FIRST SEARCH:

PROGRAM:

#include<stdio.h>

#include<stdlib.h>

**typedef** **struct** node

{

**struct** node \*next;

**int** vertex;

}node;

node \*G[20];

*//heads of linked list*

**int** visited[20];

**int** n;

**void** read\_graph();

*//create adjacency list*

**void** insert(**int**,**int**);

*//insert an edge (vi,vj) in te adjacency list*

**void** DFS(**int**);

**int** main()

{

**int** i;

    read\_graph();

*//initialised visited to 0*

**for**(i=0;i<n;i++)

        visited[i]=0;

    DFS(0);

}

**void** DFS(**int** i)

{

    node \*p;

**printf**("\n%d",i);

    p=G[i];

    visited[i]=1;

**while**(p!=**NULL**)

    {

       i=p->vertex;

**if**(!visited[i])

            DFS(i);

        p=p->next;

    }

}

**void** read\_graph()

{

**int** i,vi,vj,no\_of\_edges;

**printf**("Enter number of vertices:");

scanf("%d",&n);

*//initialise G[] with a null*

**for**(i=0;i<n;i++)

    {

        G[i]=**NULL**;

*//read edges and insert them in G[]*

**printf**("Enter number of edges:");

       scanf("%d",&no\_of\_edges);

**for**(i=0;i<no\_of\_edges;i++)

        {

**printf**("Enter an edge(u,v):");

scanf("%d%d",&vi,&vj);

insert(vi,vj);

        }

    }

}

**void** insert(**int** vi,**int** vj)

{

    node \*p,\*q;

*//acquire memory for the new node*

q=(node\*)**malloc**(**sizeof**(node));

    q->vertex=vj;

    q->next=**NULL**;

*//insert the node in the linked list number vi*

**if**(G[vi]==**NULL**)

        G[vi]=q;

**else**

    {

*//go to end of the linked list*

        p=G[vi];

**while**(p->next!=**NULL**)

         p=p->next;

        p->next=q;

    }

}

OUTPUT:

