

ADA LAB PROGRAM 1

AIM: Write a program to obtain the following:

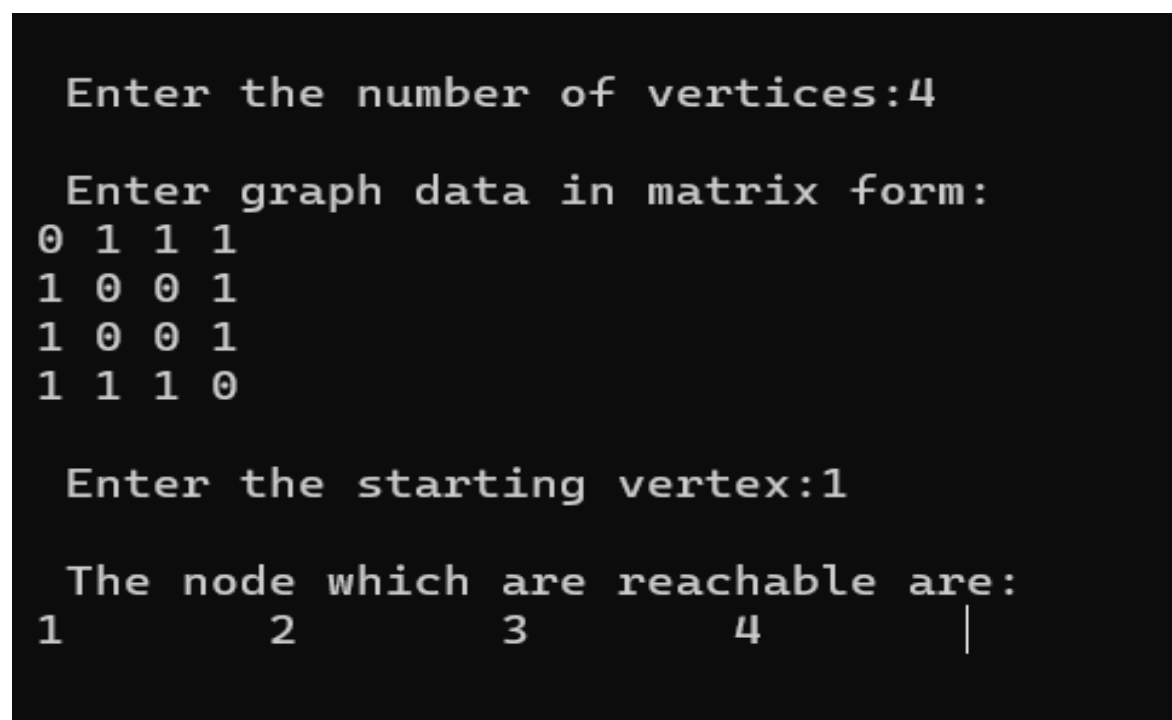
- a) Print all the nodes reachable from a given starting node in a diagraph using BFS method.
- b) Check weather a given graph is connected or not using DFS method.

SOURCE CODE: BFS METHOD

```
#include<stdio.h>
#include<conio.h>
int a[20][20],q[20],visited[20],n,i,j,f=0,r=-1;
void bfs(int v)
{
for(i=1;i<=n;i++)
if(a[v][i] && !visited[i])
q[++r]=i;
if(f<=r)
{
visited[q[f]]=1;
bfs(q[f++]);
}
}
void main()
{
int v;
printf("\n Enter the number of vertices:");
scanf("%d",&n);
for(i=1;i<=n;i++)
{
q[i]=0;
visited[i]=0;
```

```
}  
printf("\n Enter graph data in matrix form:\n");  
for(i=1;i<=n;i++)  
for(j=1;j<=n;j++)  
scanf("%d",&a[i][j]);  
printf("\n Enter the starting vertex:");  
scanf("%d",&v);  
bfs(v);  
printf("\n The node which are reachable are:\n");  
for(i=1;i<=n;i++)  
if(visited[i])  
printf("%d\t",i);  
getch();  
}
```

OUTPUT SCREENSHOT



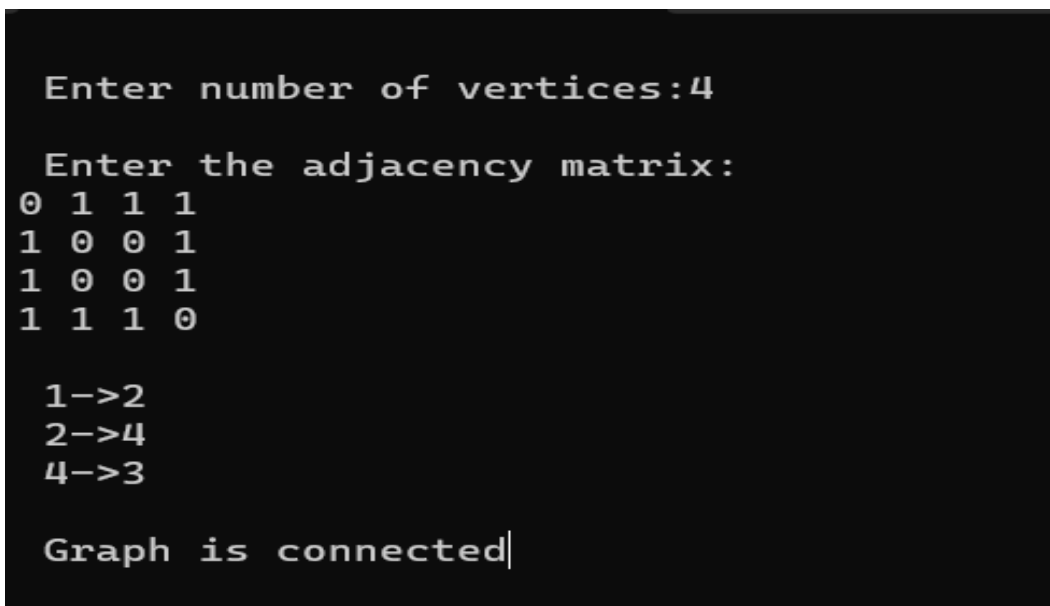
```
Enter the number of vertices:4  
  
Enter graph data in matrix form:  
0 1 1 1  
1 0 0 1  
1 0 0 1  
1 1 1 0  
  
Enter the starting vertex:1  
  
The node which are reachable are:  
1      2      3      4      |
```

SOURCE CODE: DFS METHOD

```
#include<stdio.h>
#include<conio.h>
int a[20][20],reach[20],n;
void dfs(int v)
{
    int i;
    reach[v]=1;
    for(i=1;i<=n;i++)
        if(a[v][i] && !reach[i])
        {
            printf("\n %d->%d",v,i);
            dfs(i);
        }
}
void main()
{
    int i,j,count=0;
    printf("\n Enter number of vertices:");
    scanf("%d",&n);
    for(i=1;i<=n;i++)
    {
        reach[i]=0;
        for(j=1;j<=n;j++)
            a[i][j]=0;
    }
    printf("\n Enter the adjacency matrix:\n");
    for(i=1;i<=n;i++)
        for(j=1;j<=n;j++)
            scanf("%d",&a[i][j]);
    dfs(1);
```

```
printf("\n");  
for(i=1;i<=n;i++)  
{  
if(reach[i])  
count++;  
}  
if(count==n)  
printf("\n Graph is connected");  
else  
printf("\n Graph is not connected");  
getch();  
}
```

OUTPUT SCREENSHOT



```
Enter number of vertices:4  
Enter the adjacency matrix:  
0 1 1 1  
1 0 0 1  
1 0 0 1  
1 1 1 0  
  
1->2  
2->4  
4->3  
  
Graph is connected|
```