

WEEK 1

Write program to do the following:

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

a)BFS

Code:

```
#include<stdio.h>
#include<conio.h>

int a[15][15],n;
void bfs(int);

void main() {
    int i,j,src;

    printf("\nEnter the no of nodes:\t");

    scanf("%d",&n);

    printf("\nEnter the adjacency matrix:\n");

    for(i=1;i<=n;i++)

        for(j=1;j<=n;j++)

            scanf("%d",&a[i][j]);

    printf("\nEnter the source node:\t");

    scanf("%d",&src);

    bfs(src);

}

void bfs(int src) {
```

```

int q[15],f=0,r=-1,vis[15],i,j;

for(j=1;j<=n;j++)

    vis[j]=0;

vis[src]=1;

r=r+1;

q[r]=src;

while(f<=r) {

    i=q[f];

    f=f+1;

    for(j=1;j<=n;j++)

    {

        if(a[i][j]==1&&vis[j]!=1) {

            vis[j]=1;

            r=r+1;

            q[r]=j;

        }

    }

}

for(j=1;j<=n;j++) {

    if(vis[j]!=1)

        printf("\nNode %d is not reachable",j);

    else

        printf("\nNode %d is reachable",j);

```

}

}

Output:

```
"C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\ADA\ada_lab\bfsDFS\bin\Debug\bfsDFS.exe"

Enter the no of nodes: 5

Enter the adjacency matrix:
0 1 0 0 1
0 0 0 1 0
1 0 0 1 0
0 0 0 0 0
0 1 0 0 0

Enter the source node: 1

Node 1 is reachable
Node 2 is reachable
Node 3 is not reachable
Node 4 is reachable
Node 5 is reachable
Process returned 5 (0x5)   execution time : 54.703 s
Press any key to continue.
_
```

b)DFS

Code:

```
#include<stdio.h>
#include<conio.h>

int a[10][10],n,vis[10];
int dfs(int src){
    int j;
    vis[src]=1;
    for(j=1;j<=n;j++)
        if(a[src][j]==1&&vis[j]!=1)
            dfs(j);
    for(j=1;j<=n;j++) {
        if(vis[j]!=1)
            return 0;
    }
    return 1;
}

void main()
{
    int i,j,src,ans;
    for(j=1;j<=n;j++)
        vis[j]=0;
    printf("\nEnter the no of nodes:\t");
    scanf("%d",&n);
    printf("\nEnter the adjacency matrix:\n");
    for(i=1;i<=n;i++)
        for(j=1;j<=n;j++)
            scanf("%d",&a[i][j]);
    printf("\nEnter the source node:\t");
    scanf("%d",&src);
    ans=dfs(src);
    if(ans==1)
        printf("\nGraph is connected\n");
    else
        printf("\nGraph is not connected\n");
    getch();
}
```

Output:

```
"C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\ADA\ada_lab\bfsDFS\bin\Debug\bfsDFS.exe"

Enter the no of nodes: 5

Enter the adjacency matrix:
0 1 0 0 1
0 0 0 1 0
1 0 0 1 0
0 0 0 0 0
0 1 0 0 0

Enter the source node: 1

Graph is not connected
_
```