

DSA LAB ASSIGNMENT :10

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SEC: F

- 1) Write a program to check the connectivity of a graph using DFS (Recursion). Also compute the number of components of a graph.

```
#include<stdio.h>
#include<stdlib.h>
#include<stdbool.h>

int adj[5][5];

void dfs(int u, bool visited[]) {
    visited[u] = true;
    for(int v = 0; v<5; v++) {
        if(adj[u][v]) {
            if(!visited[v])
                dfs(v, visited);
        }
    }
}

bool connected() {
    bool *vis = malloc(sizeof(bool[5]));

    for(int u; u < 5; u++) {
        for(int i = 0; i<5; i++)
            vis[i] = false;
        dfs(u, vis);
        for(int i = 0; i<5; i++) {
            if(!vis[i])
                return false;
        }
    }
    return true;
}

int main() {
    int i,j;
    printf("\n Enter graph data :\n");
    for (i=0;i<5;i++)

        for (j=0;j<5;j++)

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

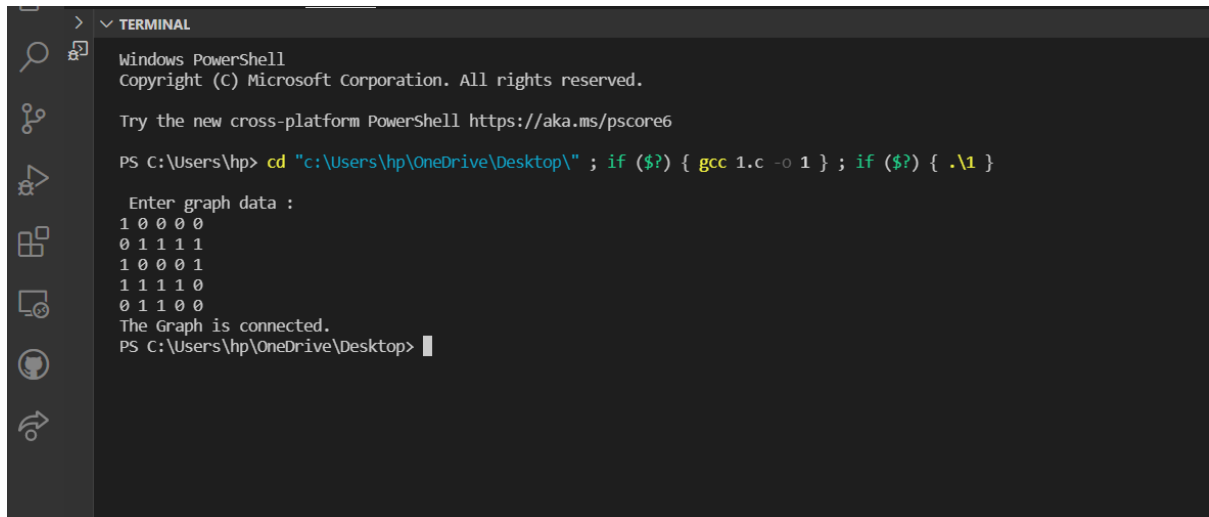
    if(connected())
        printf("The Graph is connected.");
    else
        printf("The Graph is not connected.");
}
```

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```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\hp> cd "c:\Users\hp\OneDrive\Desktop\" ; if ($?) { gcc 1.c -o 1 } ; if ($?) { .\1 }

Enter graph data :
1 0 0 0 0
0 1 1 1 1
1 0 0 0 1
1 1 1 1 0
0 1 1 0 0
The Graph is connected.
PS C:\Users\hp\OneDrive\Desktop>
```

2. Write a program to traverse the graph using BFS traversal technique. Use an explicit queue for implementation.
use adjacency matrix representation for the graph

```
#include<stdio.h>

int adj[50][50],q[20],vis[20],n,f=-1,r=-1;

void bfs(int v)
{
    int i;
    for (i=0;i<n;i++)
    {
        if(adj[v][i] != 0 && vis[i] == 0)
        {
            r=r+1;
            q[r]=i;
            vis[i]=1;
            printf("%d ",i);
        }
    }
    f=f+1;
    if(f<=r)
        bfs(q[f]);
}

int main()
{
    int v,i,j;

    printf("\n Enter the number of vertices:");
```

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```
scanf("%d",&n);
for (i=0;i<n;i++)
{
    vis[i]=0;
}

printf("\n Enter graph data :\n");
for (i=0;i<n;i++)

    for (j=0;j<n;j++)

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

printf("\n Enter the starting vertex:");

scanf("%d",&v);

f=r=0;

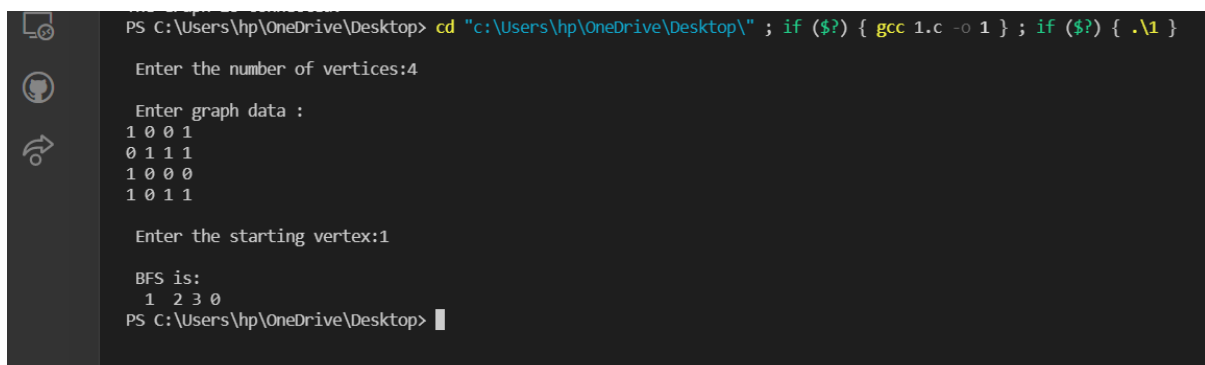
q[r]=v;

printf("\n BFS is:\n");

vis[v]=1;

printf("  %d  ",v);

bfs(v);
if(r != n-1)
    printf("\n BFS is not possible");
}
```



```
PS C:\Users\hp\OneDrive\Desktop> cd "c:\Users\hp\OneDrive\Desktop\" ; if ($?) { gcc 1.c -o 1 } ; if ($?) { .\1 }

Enter the number of vertices:4

Enter graph data :
1 0 0 1
0 1 1 1
1 0 0 0
1 0 1 1

Enter the starting vertex:1

BFS is:
1 2 3 0
PS C:\Users\hp\OneDrive\Desktop>
```