

### Lab programs:

3) Write a C program depth first search (DFS) using an array?

```
#include<stdio.h>
int G[10][10],visited[10],n;
void DFS(int i)
{
    int j;
    printf("\n%d",i);
    visited[i]=1;
    for(j=0;j<n;j++)
        if(!visited[j]&&G[i][j]==1)
            DFS(j);
}
```

```
void main()
{
    int i,j;
    printf("Enter number of vertices:");
    scanf("%d",&n);
    printf("\nEnter adjacency matrix of the graph:");
    for(i=0;i<n;i++)
        for(j=0;j<n;j++)
            scanf("%d",&G[i][j]);
    for(i=0;i<n;i++)
        visited[i]=0;
    DFS(0);
}
```

Output:

Enter number of vertices:8

Enter adjacency matrix of the graph:0 1 1 1 1 0 0 0

1 0 0 0 0 1 0 0

1 0 0 0 0 1 0 0

1 0 0 0 0 0 1 0

1 0 0 0 0 0 1 0

0 1 1 0 0 0 0 1

0 0 0 1 1 0 0 1

0 0 0 0 0 1 1 0

0

1

5

2

7

6

3

4

4) Write a C program for breath first search (BFS) using algorithm.

```
#include<stdio.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);
else
printf("\n Bfs is not possible");
}

```

Output:

Enter the number of vertices :4

Enter graph data in the matrix form:

1 1 1 1

0 1 0 0

0 0 1 0

0 0 0 1

Enter the starting vertex:1

The node which are reachable are:

1 2 3 4

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