

DATA STRUCTURE ALGORITHM

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1. Write a C program depth first search (DFS) using array

```
#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);
    else
        printf("\n Bfs is not possible");
getch();
}

```

2. Write a C program breath first search (BFS) using array

```
#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();
}

```