# Lab Programs

# DSA

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

**A>**

```
#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.**

**A>**

```
#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();
}
```

M Jaswanth

AP1911001429

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