# AI LAB ASSIGNMENT-6

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CSE-L

PROGRAM:

```
#include<stdio.h>

int q[20],top=-1,front=-1,rear=-1,a[20][20],vis[20],stack[20];
int delete();
void add(int item);
void bfs(int s,int n);
void dfs(int s,int n);
void push(int item);
int pop();

void main()
{
   int n,i,s,ch,j;
   char c,dummy;
   printf("Enter number of nodes : ");
   scanf("%d",&n);
   printf("\n");
   for(i=1;i<=n;i++)
```

```
{
   for(j=1;j<=n;j++)
   {
      printf("Enter 1 if %d has a node with %d else 0 : ",i,j);
      scanf("%d",&a[i][j]);
   }
}
printf("\n\nAdjacency matrix :\n");
for(i=1;i<=n;i++)
{
   for(j=1;j<=n;j++)
   {
      printf(" %d ",a[i][j]);
   }
   printf("\n");
}

do
{
   for(i=1;i<=n;i++)
   vis[i]=0;
   printf("\nMenu\n 1.B.F.S\n 2.D.F.S\n Enter your choice : ");
   scanf("%d",&ch);
   printf("\n Enter source node : ");
   scanf("%d",&s);
```

```
        switch(ch)
        {
           case 1: bfs(s,n);
                 break;
           case 2: dfs(s,n);
                 break;
        }
        printf("\nDo you want to continue(Y/N) : ");
        scanf("%c",&dummy);
        scanf("%c",&c);
    } while((c == 'y') || (c == 'Y'));
}



void bfs(int s,int n) //BFS
{
    int p,i;
    add(s);
    vis[s]=1;
    p=delete();
    if(p!=0)
       printf(" %d",p);
    while(p!=0)
    {
       for(i=1;i<=n;i++)
```

```
            if((a[p][i]!=0)&&(vis[i]==0))
            {
               add(i);
               vis[i]=1;
            }
         p=delete();
         if(p!=0)
            printf(" %d ",p);
      }
      for(i=1;i<=n;i++)
         if(vis[i]==0)
            bfs(i,n);
}

void add(int item)
{
   if(rear==19)
      printf("QUEUE FULL");
   else
   {
      if(rear==-1)
      {
         q[++rear]=item;
         front++;
      }
      else
```

```
        q[++rear]=item;
    }
}

int delete()
{
    int k;
    if((front>rear)||(front==-1))
        return(0);
    else
    {
        k=q[front++];
        return(k);
    }
}

void dfs(int s,int n) //DFS
{
int i,k;
    push(s);
    vis[s]=1;
    k=pop();
    if(k!=0)
        printf(" %d ",k);
    while(k!=0)
    {
```

```
        for(i=1;i<=n;i++)
            if((a[k][i]!=0)&&(vis[i]==0))
            {
                push(i);
                vis[i]=1;
            }
        k=pop();
        if(k!=0)
            printf(" %d ",k);
    }
    for(i=1;i<=n;i++)
        if(vis[i]==0)
            dfs(i,n);
}

void push(int item)
{
    if(top==19)
        printf("Stack overflow ");
    else
        stack[++top]=item;
}

int pop()
{
    int k;
```

```
    if(top==-1)
        return(0);
    else
    {
        k=stack[top--];
        return(k);
    }
}
```

## OUTPUT: