11. Develop a Program in C for the following operations on Graph(G) of Cities
a. Create a Graph of N cities using Adjacency Matrix.
b. print all the nodes reachable from a given starting node in a digraph using DFS/BFS method

```
#include<stdio.h>
#include<stdlib.h>
int a[50][50], n, visited[50];
int q[20], front = -1,rear = -1;
int s[20], top = -1, count=0;
void bfs(int v)
{
int i, cur;
visited[v] = 1;
q[++rear] = v;
while(front!=rear)
{
cur = q[++front];
for(i=1;i<=n;i++)
{
if((a[cur][i]==1)&&(visited[i]==0))
{
q[++rear] = i;
visited[i] = 1;
printf("%d ", i);
}
}
}
}
void dfs(int v)
{
int i;
visited[v]=1;
s[++top] = v;
for(i=1;i<=n;i++)
{
if(a[v][i] == 1&& visited[i] == 0 )
{

printf("%d ", i);
dfs(i);
}
}
}
int main()
```

```
{
int ch, start, i,j;
printf("\nEnter the number of vertices in graph: ");
scanf("%d",&n);
printf("\nEnter the adjacency matrix:\n");
for(i=1; i<=n; i++)
{
for(j=1;j<=n;j++)
scanf("%d",&a[i][j]);
}

printf("\nEnter the starting vertex: ");
scanf("%d",&start);

while(1){
printf("\n==>1. BFS: Print all nodes reachable from a given starting node");
printf("\n==>2. DFS: Print all nodes reachable from a given starting node");
printf("\n==>3:Exit");
printf("\nEnter your choice: ");
scanf("%d", &ch);
switch(ch)
{
case 1: printf("\nNodes reachable from starting vertex %d are: ", start);
for(i=1;i<=n;i++)
visited[i]=0;
bfs(start);
for(i=1;i<=n;i++)
{
if(visited[i]==0)
printf("\nThe vertex that is not reachable is %d" ,i);
}
break;
case 2: printf("\nNodes reachable from starting vertex %d are:\n",start);
for(i=1;i<=n;i++)
visited[i]=0;
dfs(start);
for(i=1;i<=n;i++)
{
if(visited[i]==0)
printf("\nThe vertex that is not reachable is %d" ,i);
}
break;

case 3: exit(0);
```

```
default: printf("\nPlease enter valid choice:");
}
}
}
```