**Program 11**

**Design, develop and implement a Program in C for the following operations on Graph (G) of Cities Create a Graph of N cities using Adjacency Matrix. Print all the nodes reachable from a given starting node in a digraph using BFS method**

#include<stdio.h>

#include<stdlib.h>

int n,a[10][10],i,j,source,s[10],choice,count;

void bfs(int n,int a[10][10],int source,int s[]) //BFS Algorithm

{

int q[10],u;

int front=1,rear=1;

s[source]=1;

q[rear]=source;

while(front<=rear)

{

u=q[front];

front=front+1;

for(i=1;i<=n;i++)

if(a[u][i]==1 && s[i]==0)

{

rear=rear+1;

q[rear]=i;

s[i]=1;

}

}

}

int main()

{

printf("Enter the number of nodes : ");

scanf("%d",&n);

printf("\n Enter the adjacency matrix\n");

for(i=1;i<=n;i++) //Provide matrix of 0’s and 1’s

for(j=1;j<=n;j++)

scanf("%d",&a[i][j]);

while(1)

{

printf("\nEnter your choice\n");

printf("1.BFS\n 2.Exit\n");

scanf("%d",&choice);

switch(choice)

{

case 1: printf("\n Enter the source :");

scanf("%d",&source); //Provide source for BFS

for(i=1;i<=n;i++)

s[i]=0;

bfs(n,a,source,s);

for(i=1;i<=n;i++)

{

if(s[i]==0)

printf("\n The node %d is not reachable",i);

else

printf("\n The node %d is reachable",i);

}

break;

case 2:

exit(0);

}

}

}