**Program 4**

**Write program to do the following:**

**a. Print all the nodes reachable from a given starting node in a digraph using BFS method**

**Program:**

#include<stdio.h>

#include<conio.h>

#include<time.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;

clock\_t start, end;

double time;

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);

start = clock();

bfs(v);

end = clock();

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");

time= ((double) (end - start)) / CLOCKS\_PER\_SEC;

printf("\nThe time required to compute the BFS =%f",time);

getch();

}

**Output:**



