Adj.Matrix and BFS:

Code:-

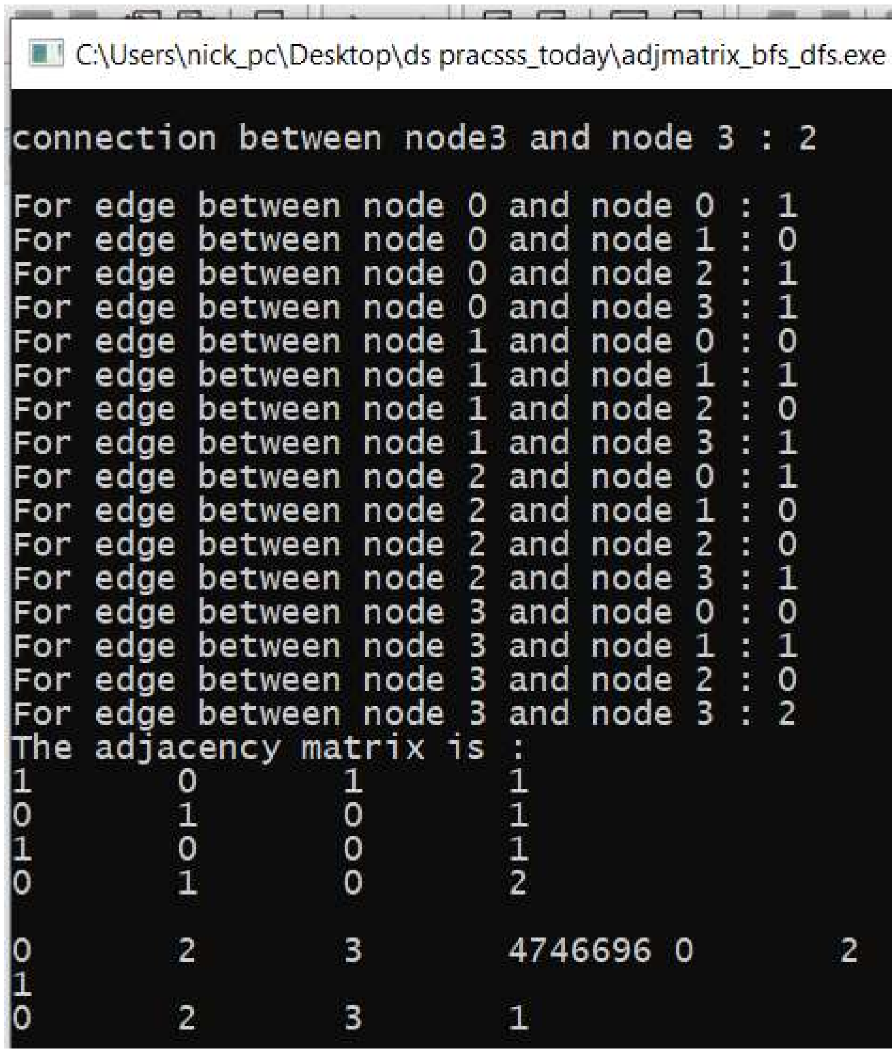
```
        #include<iostream>
#define MAX 100
using namespace std;
class nick
{
public:
int s=0;
int a[MAX][MAX];
int bfs[MAX];
int t[MAX];
int front=0;
int rear=0;

public:
void adj()
{
cout<<"how many nodes should be there? : ";
cin>>s;
cout<<s<<" by "<<s<<" Matrix ";
cout<<"\nEnter 1 if edge exists and 0 if it doesn't't"<<endl<<endl;
for(int i=0;i<s;++i)
{
for(int j=0;j<s;++j)
{
cout<<endl<<"connection between node"<< i << " and node " << j <<" : ";
cin>>a[i][j];
}
}
```

```
for(int i=0;i<s;i++)
{
for(int j=0;j<s;j++)
{
cout<<"\nFor edge between node "<< i << " and node " << j <<" : ";
cout<<a[i][j];
}
}
cout<<"\nThe adjacency matrix is :";
for (int i=0;i<s;i++)
{
cout<<endl;
for (int j=0;j<s;j++)
{
cout << a[i][j]<<"\t";
}
}
}
int visited(int node)
{
for (int i=0;i<s;i++)
{
if (node==bfs[i])
{
return 0;
}
}
for (int i=front;i<rear;i++)
{
if (node==t[i])
{
```

```
return 0;
}
}
return 1;
}

void bfsfun()
{
t[0] = 0;
int c = 0;
rear=1;
int v=0;
for (int i=0;i<s;i++)
{
for (int j=0;j<s;j++)
{
if(a[v][j]==1)
{
if(visited(j) == 1)
{
t[rear] = j;
rear++;
}
}
}
bfs[c] = t[front];
c++;
front++;
v=t[front];
for (int j = 0; j <s; j++)
{
```

```
cout <<t[j]<<"\t";
}
}
bfs_pass();
}
void bfs_pass()
{
cout << endl;
for (int j=0;j<s;j++)
{
cout <<bfs[j]<<"\t";
}
}
};
int main()
{
nick o;
o.adj();
o.bfsfun();
}
```

Output:-



C:\Users\nick_pc\Desktop\ds pracsss_today\adjmatrix_bfs_dfs.exe

```
connection between node3 and node 3 : 2

For edge between node 0 and node 0 : 1
For edge between node 0 and node 1 : 0
For edge between node 0 and node 2 : 1
For edge between node 0 and node 3 : 1
For edge between node 1 and node 0 : 0
For edge between node 1 and node 1 : 1
For edge between node 1 and node 2 : 0
For edge between node 1 and node 3 : 1
For edge between node 2 and node 0 : 1
For edge between node 2 and node 1 : 0
For edge between node 2 and node 2 : 0
For edge between node 2 and node 3 : 1
For edge between node 3 and node 0 : 0
For edge between node 3 and node 1 : 1
For edge between node 3 and node 2 : 0
For edge between node 3 and node 3 : 2
The adjacency matrix is :
1       0       1       1
0       1       0       1
1       0       0       1
0       1       0       2

0       2       3       4746696 0       2
1
0       2       3       1
```

Adj.Matrix and DFS:

Code:-

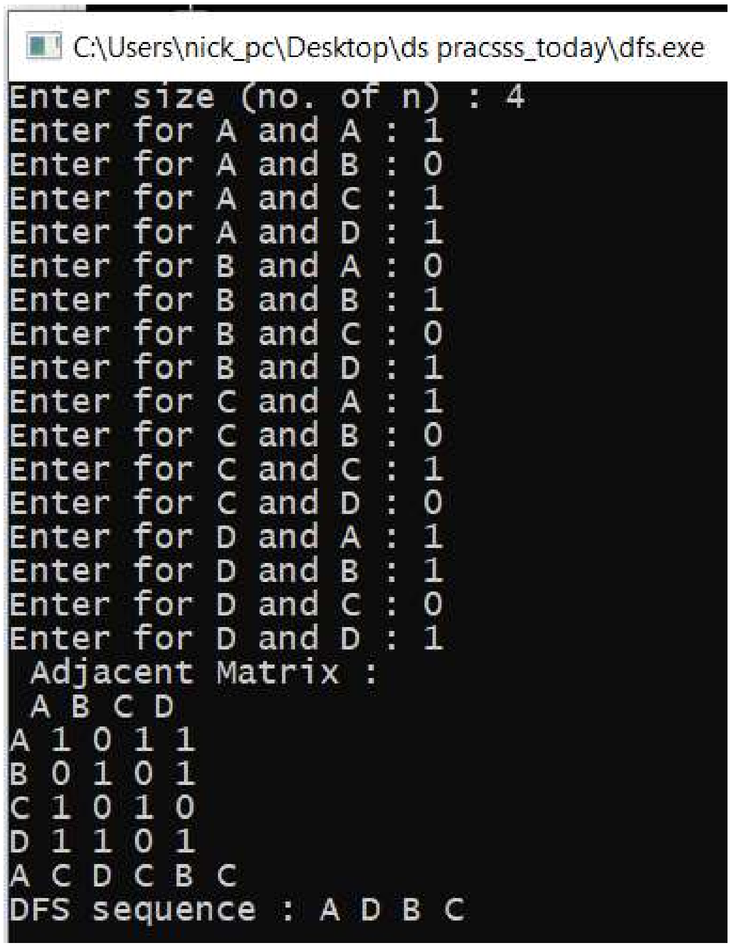
```
#include <iostream>

using namespace std;

class nick

{

public:

 int n, a[100][100], top = 0;

 char ch = 'A', c1, c2, stack[100], dfs[100];

 nick()

 {

 mytech();
```

```
}
void mytech()
{
cout <<"Enter size (no. of n) : ";
cin >> n;
for (int i = 0; i < n; i++)
{
dfs[i] = '0';
for (int j = 0; j < n; j++)
{
c1 = ch + i;
c2 = ch + j;
cout << "Enter for " << c1 << " and " << c2 << " : ";
cin >> a[i][j];
}
}
dis();
}
void dis()
{
cout << " Adjacent Matrix : " << endl;
cout << " ";
for (int i = 0; i < n; i++)
{
c1 = ch + i;
cout << c1 << " ";
}
cout << endl;
for (int i = 0; i < n; i++)
{
c1 = ch + i;
```

```
cout << c1 << " ";

for (int j = 0; j < n; j++)

{

cout << a[i][j] << " ";

}

cout << endl;

}

Pass();

}

void Pass()

{

int c = 0, s = 0, count = 0;

stack[0] = 'A';

top = 0;

display_stack();

while (s < n)

{

dfs[count] = stack[top];

count++;

c = stack[top] - 65;

top--;

for (int i = 0; i < n; i++)

{

if (a[c][i] == 1)

{

if (check(i) == true)

{

c1 = 65 + i;

top++;

stack[top] = c1;

}
}
}
display_stack();
s++;
}
display_dfs();
}
bool check(int cha)
{
char c;
c = 65 + cha;
for (int i = 0; i < n; i++)
{
if (c == dfs[i])
{
return false;
}
}
for (int i = 0; i <= top; i++)
{
if (c == stack[i])
{
return false;
}
}
return true;
}
void display_dfs()
{
cout << endl << "DFS sequence : ";
for (int i = 0; i < n; i++)
```

```
 cout << dfs[i] << " ";
 cout << endl;
 }
 void display_stack()
 {
 for (int i = 0; i <= top; i++)
 cout << stack[i] << " ";
 }
};
int main()
{
 nick a;
}
```

Output:-



C:\Users\nick_pc\Desktop\ds pracsss_today\dfs.exe

```
Enter size (no. of n) : 4
Enter for A and A : 1
Enter for A and B : 0
Enter for A and C : 1
Enter for A and D : 1
Enter for B and A : 0
Enter for B and B : 1
Enter for B and C : 0
Enter for B and D : 1
Enter for C and A : 1
Enter for C and B : 0
Enter for C and C : 1
Enter for C and D : 0
Enter for D and A : 1
Enter for D and B : 1
Enter for D and C : 0
Enter for D and D : 1
 Adjacent Matrix :
 A B C D
A 1 0 1 1
B 0 1 0 1
C 1 0 1 0
D 1 1 0 1
A C D C B C
DFS sequence : A D B C
```