**ASSIGNMENT NO 6  
TITLE: FLIGHT PATHS**

CODE:  
#include<iostream>

#include<queue>

#include<stack>

using namespace std;

class Graph

{

string city[10];

int a[10][10];

int n;

public:

void input();

void display();

void BFS();

void DFS();

};

void Graph::input()

{

cout<<"\nEnter No Of Cities: ";

cin>>n;

cout<<"\nEnter The Names Of Cities: ";

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

cin >> city[i];

cout<<"\nEnter The Distances: ";

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

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

{

if(i==j)

{

a[i][j] = 0;

continue;

}

cout<<"\nEnter The Distance Between " << city[i] <<" and " << city[j]<< " : ";

cin >> a[i][j];

a[j][i] = a[i][j];

}

}

void Graph::display()

{

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

{

cout<<"\n";

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

{

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

}

}

}

void Graph::BFS()

{

cout<<"\n\nBFS Traversal: ";

queue<int> q;

int visit[n];

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

visit[i] = 0;

string start;

int index;

cout<<"\nEnter Starting City: ";

cin>>start;

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

if(start == city[i])

index =i;

visit[index] = 1;

cout<<city[index]<<" -> ";

int current = index;

while(1)

{

 for(int i=0 ; i<n ; i++)

{

if(a[current][i]!=0 && visit[i] == 0)

{

visit[i] = 1;

q.push(i);

 cout<<city[i]<<" -> ";

}

}

if(q.empty()!=0)

break;

else

{

current = q.front();

 q.pop();

}

}

}

void Graph::DFS()

{

cout<<"\n\nDFS Traversal: ";

stack<int> s;

int visit[n];

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

 visit[i] = 0;

string start;

int index;

cout<<"\nEnter Starting City: ";

cin>>start;

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

if(start == city[i])

index =i;

s.push(index);

visit[index] = 1;

int current = index;

cout << city[index]<<" -> ";

while(1)

{

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

{

if(a[current][i]!=0 && visit[i]==0)

{

s.push(i);

cout<<city[i]<<" -> ";

visit[i] = 1;

 current = i;

i=0;

}

}

if(s.empty()!=0)

break;

else

{

 current = s.top();

s.pop();

}

}

}

int main()

{

Graph g1;

int choice;

MENU:

cout<<"\n\nGraph Trversal";

cout<<"\n1.Input data";

cout<<"\n2.Display data";

 cout<<"\n3.DFS Traversal";

cout<<"\n4.BFS Traversal";

cout<<"\n5.Exit";

cout<<"\nEnter your choice: ";

cin >> choice;

switch(choice)

{

case 1:

g1.input();

break;

 case 2:

g1.display();

break;

case 3:

g1.DFS();

break;

case 4:

g1.BFS();

break;

case 5:

return 0;

default:

cout<<"\nInvalid choice.";

}

if(choice != 5)

goto MENU;

return 0;

}

Output:  
