#include "stack.h"

#include <iostream>

#include <cstdlib>

#include <cstring>

#define RIGHT 1

#define LEFT 2

#define UP 3

#define DOWN 4

using namespace std;

char lab[15][22]={"#o###################",

"# # # # #",

"# ### # ###### ## # #",

"# # # # # # #",

"# # ### ######## ## #",

"# # # ## # #",

"### # # # ## # # ####",

"# # # # # # #",

"# # # # # ######### #",

"# # # # # # # #",

"# # # # # ##### E",

"# # ##### # # #####",

"# # # #",

"#####################"};

void printlab(char l[15][22]) {

for (int i = 0; i < 14; i++) {

for (int j = 0; j < 21; j++)

cout << l[i][j];

cout << endl;

}

cout << endl << endl;

}

int main(){

Stack s, s2;

s.create();

int gi, gj, ci, cj;

for (int i = 0; i < 14; i++) {

for (int j = 0; j < 21; j++){

if(lab[i][j]=='o'){gi=i; gj=j;}

if(lab[i][j]=='E'){ci=i; cj=j;}

}

}

position entrance = {gj,gi,0,0,0,0,0};

position exit = {cj,ci,0,0,0,0,0};

position p = entrance;

position decision;

p.camefrom = LEFT;

printlab(lab);

bool goback = false;

while (p.x != exit.x || p.y != exit.y) {

system("cls");

lab[p.y][p.x]='o';

printlab(lab);

if (!goback) {

p.right = 0; p.left = 0; p.down = 0; p.up = 0;

if (p.x<20 && lab[p.y][p.x+1]!='#') p.right=1;

if (p.x>0 && lab[p.y][p.x-1]!='#') p.left=1;

if (p.y<14 && lab[p.y+1][p.x]!='#') p.down=1;

if (p.y>0 && lab[p.y-1][p.x]!='#') p.up=1;

}

else goback = false;

bool moved = true;

position past = p;

if (p.down && p.camefrom != DOWN)

{p.y++; p.camefrom = UP; past.down = 0; }

else if (p.up && p.camefrom != UP)

{p.y--; p.camefrom = DOWN; past.up = 0; }

else if (p.left && p.camefrom != LEFT)

{p.x--; p.camefrom = RIGHT; past.left = 0;}

else if (p.right && p.camefrom != RIGHT)

{p.x++; p.camefrom = LEFT; past.right = 0;}

else moved = false;

if (p.x != exit.x || p.y != exit.y) {

if ( (p.down + p.up + p.right + p.left) > 2) {

s.push(past);

}

if (!moved) {

if ( !s.isempty() ) {

decision = s.pop();

while(p.x!=decision.x || p.y!=decision.y){

system("cls");

lab[p.y][p.x]=' ';

if (lab[p.y][p.x+1]=='o') p.x++;

else if (lab[p.y][p.x-1]=='o') p.x--;

else if (lab[p.y+1][p.x]=='o') p.y++;

else if (lab[p.y-1][p.x]=='o') p.y--;

printlab(lab);

for(int i=0; i<200000000; i++){}

}

p = decision;

goback = true;

}

}

}

for(int i=0; i<200000000; i++){}

}

lab[p.y][p.x] = 'o';

printlab(lab);

cout << "Path is shown above" << endl;

system("pause");

return EXIT\_SUCCESS;

}