//bfs

#include<stdio.h>

#include<math.h>

#include<GL/glut.h>

int i,n,x[20],y[20],j,edge1[20],edge2[20],ne,a[20][20],v,q[20],visited[20],f=0,r=-1,pi[20];

void init() {

glutInitDisplayMode(GLUT\_SINGLE|GLUT\_RGB);

glutInitWindowPosition(0,0);

glutInitWindowSize(640, 480);

glutCreateWindow("bfs");

glClearColor(0.0,0.0,0.0,0);

glColor3f(1.0,1.0,1.0);

glPointSize(15.0);

gluOrtho2D(-320,320,-240,240);

}

void delay(int x)

{ int i=0,j=0;

for(i=0;i<x;i++){for(j=0;j<200000;j++){}}

}

void bfs(int v) {

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

if(a[v][i] && !visited[i]){

q[++r]=i;

pi[i]=v;

visited[i]=1;

glColor3f(1.0,0.0,0.0);

glBegin(GL\_LINES);

glVertex2i(x[i],y[i]);

glVertex2i(x[pi[i]],y[pi[i]]);

glEnd();

glFlush();

delay(3000);

}

if(f<=r) {

bfs(q[f++]);

}

}

void display(void)

{

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

glPointSize(15.0);

glBegin(GL\_POINTS);

glVertex2i(x[i],y[i]);

glEnd();

glPointSize(6.0);

glRasterPos2f(x[i]+10,y[i]+10);

glutBitmapCharacter(GLUT\_BITMAP\_TIMES\_ROMAN\_24,i+48);

glFlush();

}

glColor3f(1.0,1.0,1.0);

glPointSize(5.0);

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

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

{

if(a[i][j]){

glBegin(GL\_LINES);

glVertex2i(x[i],y[i]);

glVertex2i(x[j],y[j]);

glEnd();

glFlush();

}

}

}

printf("\n Enter the starting vertex:");

scanf("%d",&v);

bfs(v);

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

if(!visited[i])

printf("\n Bfs is not possible");

}

}

int main(int argc,char \*\*argv)

{

printf("\nNumber of nodes:");

scanf("%d",&n);

printf("\nRead node coordinates(x,y):\n");

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

scanf("%d%d",&x[i],&y[i]);

q[i]=0;

visited[i]=0;

pi[i]=0;

}

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

{

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

{

a[i][j]=0;

}

}

printf("\nNumber of edges:");

scanf("%d",&ne);

printf("\nRead edges(node1,node2):\n");

for(i=0;i<ne;i++)

{

scanf("%d%d",&edge1[i],&edge2[i]);

a[edge1[i]][edge2[i]]=1;

a[edge2[i]][edge1[i]]=1;

}

printf("\nGraph in matrix form:\n");

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

{

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

{

printf("%d\t",a[i][j]);

}

printf("\n");

}

glutInit(&argc, argv);

init();

glClear(GL\_COLOR\_BUFFER\_BIT);

glutDisplayFunc(display);

glutMainLoop();

return 0;

}

/\*

OUTPUT

Number of nodes:9

Read node coordinates(x,y):

-200 0

-100 100

0 100

100 100

200 0

100 -100

0 -100

-100 -100

0 0

Number of edges:14

Read edges(node1,node2):

0 1

0 7

1 2

1 7

2 3

2 5

2 8

3 4

3 5

4 5

5 6

6 7

6 8

7 8

Graph in matrix form:

0 1 0 0 0 0 0 1 0

1 0 1 0 0 0 0 1 0

0 1 0 1 0 1 0 0 1

0 0 1 0 1 1 0 0 0

0 0 0 1 0 1 0 0 0

0 0 1 1 1 0 1 0 0

0 0 0 0 0 1 0 1 1

1 1 0 0 0 0 1 0 1

0 0 1 0 0 0 1 1 0

Enter the starting vertex:0

\*/

