IMPLEMENT LINE CLIPPING ALGORITHM: COHEN SUTHERLAND

#include<stdio.h> #include<stdlib.h> #include<math.h> #include<graphics.h> #include<dos.h>

typedef struct coordinate

{

int x,y;

char code[4];

}PT;

void drawwindow();

void drawline(PT p1,PT p2); PT setcode(PT p);

int visibility(PT p1,PT p2); PT resetendpt(PT p1,PT p2);

void main()

{

int gd=DETECT,v,gm; PT p1,p2,p3,p4,ptemp; clrscr();

printf("\nEnter x1 and y1\n"); scanf("%d %d",&p1.x,&p1.y); printf("\nEnter x2 and y2\n"); scanf("%d %d",&p2.x,&p2.y);

initgraph(&gd,&gm,"c:\\turboc3\\bgi"); drawwindow();

delay(500); drawline(p1,p2); delay(500); cleardevice();

delay(500); p1=setcode(p1); p2=setcode(p2); v=visibility(p1,p2); delay(500);

switch(v)

{

case 0: drawwindow();

delay(500); drawline(p1,p2); break;

case 1: drawwindow();

delay(500); break;

case 2: p3=resetendpt(p1,p2);

p4=resetendpt(p2,p1); drawwindow();

}

delay(5000); closegraph();

delay(500); drawline(p3,p4); break;

}

void drawwindow()

{

line(150,100,450,100); line(450,100,450,350); line(450,350,150,350); line(150,350,150,100);

}

void drawline(PT p1,PT p2)

{

line(p1.x,p1.y,p2.x,p2.y);

}

PT setcode(PT p) //for setting the 4 bit code

{

PT ptemp;

if(p.y<100)

ptemp.code[0]='1'; //Top

else

ptemp.code[0]='0';

if(p.y>350)

ptemp.code[1]='1'; //Bottom

else

ptemp.code[1]='0';

if(p.x>450)

ptemp.code[2]='1'; //Right

else

ptemp.code[2]='0';

if(p.x<150)

ptemp.code[3]='1'; //Left

else

ptemp.code[3]='0';

ptemp.x=p.x; ptemp.y=p.y;

return(ptemp);

}

int visibility(PT p1,PT p2)

{

int i,flag=0;

for(i=0;i<4;i++)

{

if((p1.code[i]!='0') || (p2.code[i]!='0')) flag=1;

}

if(flag==0)

return(0);

for(i=0;i<4;i++)

{

if((p1.code[i]==p2.code[i]) && (p1.code[i]=='1')) flag='0';

}

if(flag==0)

return(1);

return(2);

}

PT resetendpt(PT p1,PT p2)

{

PT temp; int x,y,i; float m,k;

if(p1.code[3]=='1')

x=150;

if(p1.code[2]=='1')

x=450;

if((p1.code[3]=='1') || (p1.code[2]=='1'))

{

m=(float)(p2.y-p1.y)/(p2.x-p1.x);

k=(p1.y+(m\*(x-p1.x))); temp.y=k;

temp.x=x;

for(i=0;i<4;i++)

temp.code[i]=p1.code[i];

if(temp.y<=350 && temp.y>=100) return (temp);

}

if(p1.code[0]=='1')

y=100;

if(p1.code[1]=='1')

y=350;

if((p1.code[0]=='1') || (p1.code[1]=='1'))

{

m=(float)(p2.y-p1.y)/(p2.x-p1.x);

k=(float)p1.x+(float)(y-p1.y)/m; temp.x=k;

temp.y=y;

for(i=0;i<4;i++)

temp.code[i]=p1.code[i];

}

else

}

return(temp);

return(p1);