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1  //SHREYAS SAWANT D7A 55
2  //Implement Line Clipping Algorithm- Cohen Sutherland
3
4  #include<stdio.h>
5  #include<stdlib.h>
6  #include<math.h>
7  #include<graphics.h>
8
9
10 typedef struct coordinate
11 {
12     int x,y;
13     char code[4];
14 }Point;
15
16 void drawwindow();
17 void drawline(Point p1,Point p2);
18 Point setcode(Point p);
19 int visibility(Point p1,Point p2);
20 Point newendpt(Point p1,Point p2);
21 int xli,x2e,yli,y2e;
22
23 int main()
24 {
25     int gd=DETECT,v,gm;
26     Point p1,p2,p3,p4,ptemp;
27
28     printf("Enter the top left corner and bottom right corner of clipping window\n");
29     scanf("%d%d%d%d",&xli,&yli,&x2e,&y2e);
30     printf("\nEnter x1 and y1\n");
31     scanf("%d %d",&p1.x,&p1.y);
32     printf("\nEnter x2 and y2\n");
33     scanf("%d %d",&p2.x,&p2.y);
34
35     initgraph(&gd,&gm,"");
36     drawwindow();
37     drawline(p1,p2);
38     outtextxy(250,50,"ORIGINAL LINE");
39     getch();
40
41     cleardevice();
42     p1=setcode(p1);
43     p2=setcode(p2);
44     v=visibility(p1,p2);
45     outtextxy(250,50,"LINE AFTER CLIPPING");
46     switch(v)
47     {
48         case 0:
49             drawwindow();
50             delay(500);
51             drawline(p1,p2);
52             break;
53         case 1:
54             drawwindow();
55             delay(500);
56             break;
57         case 2:
58             p3=newendpt(p1,p2);
59             p4=newendpt(p2,p1);
60             drawwindow();
61             drawline(p3,p4);
62             getch();
63             break;
64     }
65     restorecrtmode();
66     closegraph();
67 }
68
69 void drawwindow()
70 {setcolor(9);
71 rectangle(xli,yli,x2e,y2e);
72 }
73
74 void drawline(Point p1,Point p2)
75 {setcolor(15);
76 line(p1.x,p1.y,p2.x,p2.y);
77 }
78
79 Point setcode(Point p)
80 {
81     Point ptemp;
82     if(p.y<yli)
83         ptemp.code[0]='1'; //Top
84     else

```

```

85     ptemp.code[0]='0';
86     if(p.y>y2e)
87         ptemp.code[1]='1'; //Bottom
88     else
89         ptemp.code[1]='0';
90     if(p.x>x2e)
91         ptemp.code[2]='1'; //Right
92     else
93         ptemp.code[2]='0';
94     if(p.x<x1i)
95         ptemp.code[3]='1'; //Left
96     else
97         ptemp.code[3]='0';
98     ptemp.x=p.x;
99     ptemp.y=p.y;
100    return(ptemp);
101 }
102
103 int visibility(Point p1,Point p2)//To get coordinates Code
104 {
105     int i,flag=0;
106     for(i=0;i<4;i++)
107     {
108         if((p1.code[i]!='0') || (p2.code[i]!='0'))
109             flag=1;
110     }
111     if(flag==0)
112         return(0);
113     for(i=0;i<4;i++)
114     {
115         if((p1.code[i]==p2.code[i]) && (p1.code[i]=='1'))
116             flag='0';
117     }
118     if(flag==0)
119         return(1);
120     return(2);
121 }
122
123 Point newendpt(Point p1,Point p2)//To reset endpoint of line by finding intersection point
124 {
125     Point temp;
126     int x,y,i;
127     float m,k;
128
129     if(p1.code[3]=='1')
130         x=x1i;
131     if(p1.code[2]=='1')
132         x=x2e;
133
134     if((p1.code[3]=='1') || (p1.code[2]=='1'))
135     {
136         m=(float)(p2.y-p1.y)/(p2.x-p1.x);
137         k=(p1.y+(m*(x-p1.x)));
138         temp.y=k;
139         temp.x=x;
140
141         for(i=0;i<4;i++)
142             temp.code[i]=p1.code[i];
143         if(temp.y<=y2e && temp.y>=y1i)
144             return (temp);
145     }
146
147     if(p1.code[0]=='1')
148         y=y1i;
149     if(p1.code[1]=='1')
150         y=y2e;
151
152     if((p1.code[0]=='1') || (p1.code[1]=='1'))
153     {
154         m=(float)(p2.y-p1.y)/(p2.x-p1.x);
155         k=(float)p1.x+(float)(y-p1.y)/m;
156         temp.x=k;
157         temp.y=y;
158
159         for(i=0;i<4;i++)
160             temp.code[i]=p1.code[i];
161         return(temp);
162     }
163
164     else
165         return(p1);
166 }
167

```

"C:\Users\user\Desktop\SHREYAS\SEM II\Line Clipping.exe"

Enter the top left corner and bottom right corner of clipping window

200 200

400 300

Enter x1 and y1

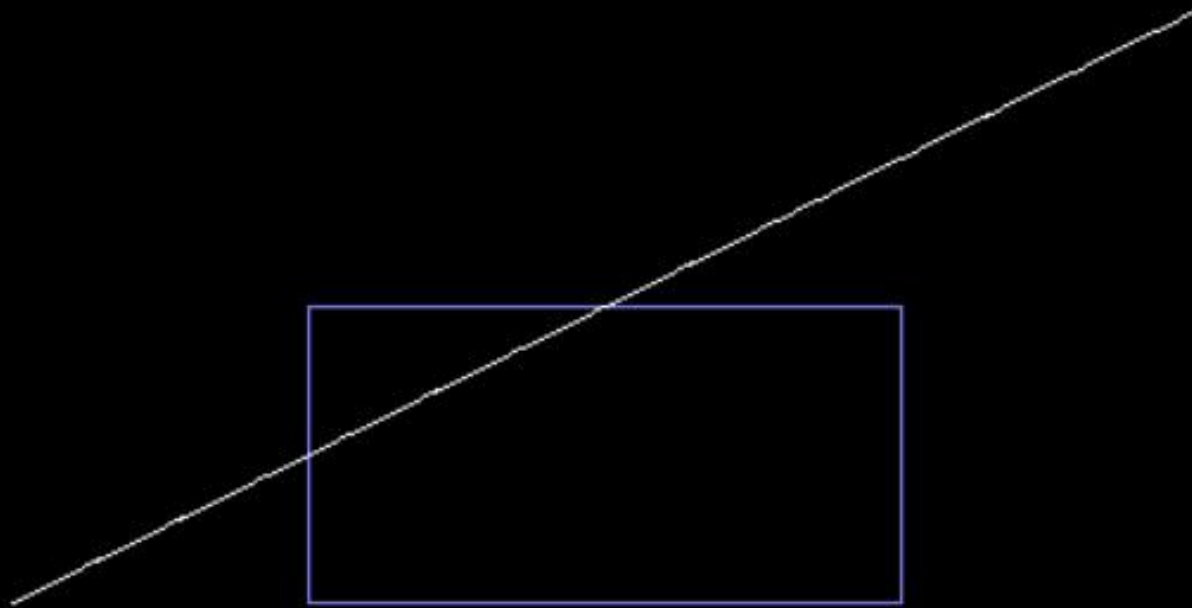
100 300

Enter x2 and y2

500 100

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ORIGINAL LINE



LINE AFTER CLIPPING

