**Program 13(b)**

**Write a program to implement Liang Barsky Algorithm.**

#include<stdio.h>

#include<graphics.h>

#define ROUND(a) ((int)(a+0.5))

void ddaline(int x1, int y1, int x2, int y2)

{

float xsteps, ysteps, x=x1, y=y1;

int dx = x2-x1;

int dy = y2-y1;

int steps,k=1;

if(abs(dx)>=abs(dy))

steps=abs(dx);

else steps=abs(dy);

xsteps= dx/(float)steps;

ysteps= dy/(float)steps;

putpixel(ROUND(x),ROUND(y),15);

while(k<=steps)

{

x+=xsteps;

y+=ysteps;

putpixel(ROUND(x), ROUND(y),15);

k++;

}

}

void lineclip(float xwmin,float ywmin,float xwmax,float ywmax,float x1,float y1,float x2,float y2)

{

float x11,y11,x21,y21;

float xdelta=x2-x1;

float ydelta=y2-y1;

float p=0,q=0,r=0;

float t0=0;

float t1=1;

for(int edge =0;edge<4;edge++)

{

if(edge==0)

{

p=-xdelta;

q=-(xwmin-x1);

}

else if(edge==1)

{

p=xdelta;

q=(xwmax-x1);

}

else if(edge==2)

{

p=-ydelta;

q=-(ywmin-y1);

}

else if(edge==3)

{

p=ydelta;

q=(ywmax-y1);

}

r=q/p;

if(p==0 && q<0)

{

printf("The line is totaly outside the clipping window.\n");

return ;

}

if(p<0)

{

if(r>t1)

{

printf("The line is totaly outside the clipping window.\n");

return ;

}

else if(r>t0)

t0=r;

}

else if(p>0)

{

if(r<t0)

{

printf("The line is totaly outside the clipping window.\n");

return ;

}

else if(r<t1)

t1=r;

}

}

if(t0>0)

{ x11=x1+t0\*xdelta;

y11=y1+t0\*ydelta;

}

if(t1<1)

{

x21=x1+t1\*xdelta;

y21=y1+t1\*ydelta;

}

ddaline(x11,y11,x21,y21);

ddaline(xwmin,ywmin,xwmin,ywmax);

ddaline(xwmin,ywmax,xwmax,ywmax);

ddaline(xwmax,ywmax,xwmax,ywmin);

ddaline(xwmax,ywmin,xwmin,ywmin);

}

int main()

{

float x2,y2,x1,y1,xwmin,ywmin,xwmax,ywmax;

int gdriver = DETECT, gmode, errorcode;

initgraph(&gdriver, &gmode, "..\\");

errorcode = graphresult();

if (errorcode != grOk)

{

printf("Graphics error: %s\n", grapherrormsg(errorcode));

printf("Press any key to halt:");

getch();

exit(1);

}

printf("Enter the starting point\n");

scanf("%f %f", &x1, &y1);

printf("Enter the ending point\n");

scanf("%f %f", &x2, &y2);

printf("Enter xwmin, ywmin, xwmax, ywmax\n");

scanf("%f %f %f %f",&xwmin,&ywmin,&xwmax,&ywmax);

lineclip(xwmin,ywmin,xwmax,ywmax,x1,y1,x2,y2);

getch();

closegraph();

return 0;

}



