**Program 16(c)**

**Write a program to create fractal design using squares.**

#include<iostream.h>

#include<conio.h>

#include<stdio.h>

#include<math.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 square(int x1, int y1, int x2, int y2)

{

float angle;

float x11,y11,x12,y12,x13,y13,x33,y33,x23,y23,x21,y21,x22,y22;

angle=90\*3.142/180;

x11=(3\*x1+x2)/4;

x33=(x1+x2)/2;

x21=(3\*x2+x1)/4;

y11=(3\*y1+y2)/4;

y33=(y1+y2)/2;

y21=(3\*y2+y1)/4;

x12=x11+((x33-x11)\*cos(angle)-(y33-y11)\*sin(angle));

x13=x33+((x21-x33)\*cos(angle)-(y21-y33)\*sin(angle));

x23=x33+((x21-x33)\*cos(-angle)-(y21-y33)\*sin(-angle));

x22=x21+((x2-x21)\*cos(-angle)-(y2-y21)\*sin(-angle));

y12=y11+((x33-x11)\*sin(angle)+(y33-y11)\*cos(angle));

y13=y33+((x21-x33)\*sin(angle)+(y21-y33)\*cos(angle));

y23=y33+((x21-x33)\*sin(-angle)+(y21-y33)\*cos(-angle));

y22=y21+((x2-x21)\*sin(-angle)+(y2-y21)\*cos(-angle));

if( ( (x11-x22)\*(x11-x22)+ (y11-y22)\*(y11-y22) ) < 2500 )

{

ddaline(x1, y1, x11, y11);

ddaline(x11,y11,x12,y12);

ddaline(x12,y12,x13,y13);

ddaline(x13,y13,x23,y23);

ddaline(x23,y23,x22,y22);

ddaline(x22,y22,x21,y21);

ddaline(x21,y21,x2,y2);

return;

}

square(x1, y1, x11, y11);

square(x11,y11,x12,y12);

square(x12,y12,x13,y13);

square(x13,y13,x33,y33);

square(x33,y33,x23,y23);

square(x23,y23,x22,y22);

square(x22,y22,x21,y21);

square(x21,y21,x2,y2);

}

int main()

{

int x1,y1,x2,y2;

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();

goto end;

}

printf("Enter the Co-ordinates\n");

scanf("%d%d%d%d",&x1,&y1,&x2,&y2);

square(x1,y1,x2,y2);

getch();

closegraph();

end: return 0;

}