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#include<bits/stdc++.h>
#include<graphics.h>
using namespace std;

void Bresenhamline(int x1,int y1,int x2,int y2)
{
    int dx,dy,inc1,inc2,inc3,inc4,d;
    float m;

    if(x1>x2)
    {
        int tmp = x1;
        x1 = x2;
        x2 = tmp;
    }
    if(y1>y2)
    {
        int tmp = y1;
        y1 = y2;
        y2 = tmp;
    }

    dx=x2-x1;
    dy= y2-y1;
    m = dy/dx;
    if(m<=1)
    {
        d = 2*dy-dx;
        inc1 = 2*dy;
        inc2 = 2*(dy-dx);
        while(x1<=x2)
        {
            putpixel(x1,y1,15);
            if(d<=0)
            {
                d = d+inc1;
            }
            else{
                d =d+inc2;
                y1++;
            }
            x1++;
        }
    }
    else
    {

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    d = 2*dx-dy;
    inc3 = 2*dx;
    inc4 = 2*(dx-dy);
    while(y1<=y2)
    {
        putpixel(x1,y1,15);
        if(d<=0)
        {
            d = d+inc3;
        }
        else{
            d =d+inc4;
            x1++;
        }
        y1++;
    }
}

void BresenhamCircle(int x1,int y1,int r)
{
    int x,y,d;
    x = 0;
    y = r;
    d = 3-(2*r);
    while(x<=y)
    {
        putpixel(x1+x,y1+y,15);
        putpixel(x1-x,y1+y,15);
        putpixel(x1+x,y1-y,15);
        putpixel(x1-x,y1-y,15);
        putpixel(x1+y,y1+x,RED);
        putpixel(x1+y,y1-x,RED);
        putpixel(x1-y,y1+x,RED);
        putpixel(x1-y,y1-x,RED);
        x=x+1;
        if(d<0)
        {
            d = d+4*(x)+6;
        }
        else
        {
            d = d+4*(x-y)+10;
            y=y-1;
        }
    }
}

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        delay(20);
    }
}

int main()
{
    int gd=DETECT, gm;
    initgraph(&gd, &gm, "");

    Bresenhamline(10, 10, 400, 11);
    Bresenhamline(10, 10, 9, 250);
    Bresenhamline(9, 250, 399, 249);
    Bresenhamline(399, 249, 400, 11);

    int px1=10, py1=10;
    int px2=9, py2=250;
    int px3=399, py3=249;
    int px4=400, py4=11;
    int cx = round((px1+px4)/2);
    int cy = round((py1+py2)/2);
    BresenhamCircle(cx, cy, 60);

    int x1 = (px1+px4)/2;
    int y1 = 10;
    int y2 = cy - 60;
    Bresenhamline(x1, y1, x1+1, y2);

    int ly1 = 250;
    int ly2 = cy + 60;
    Bresenhamline(x1, ly1, x1+1, ly2);

    getch();

    // while(!kbhit())
    // {
    //     delay(200);
    // }
    return 0;
}

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