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#include <bits/stdc++.h>
#include <graphics.h>
#include <conio.h>
#include <dos.h>
#include<math.h>
#include<string.h>
using namespace std;

void BresenhamCircle(float x1,float y1,float r)
{
    int X,Y;
    float x_new,y_new;
    X = getmaxx();
    Y = getmaxy();
    rectangle(0,0,X,Y);
    line(X/2,0,X/2,Y);
    line(0,Y/2,X,Y/2);
    x_new = X/2;
    y_new = Y/2;

    float x,y,d;
    x1 = x_new-x1;
    y1 = y_new+y1;
    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,GREEN);
        putpixel(x1+y,y1-x,GREEN);
        putpixel(x1-y,y1+x,GREEN);
        putpixel(x1-y,y1-x,GREEN);
        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);
}

}

void MidPoint(float x1,float y1,float r)
{
    int X,Y;
    float x_new,y_new;
    X = getmaxx();
    Y = getmaxy();
    rectangle(0,0,X,Y);
    line(X/2,0,X/2,Y);
    line(0,Y/2,X,Y/2);
    x_new = X/2;
    y_new = Y/2;

    //outtextxy(x_new,y_new,"(0,0)");

    float x,y,d;
    x1 = x_new-x1;
    y1 = y_new+y1;
    x = 0;
    y = r;
    d = 1-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,GREEN);
        putpixel(x1+y,y1-x,GREEN);
        putpixel(x1-y,y1+x,GREEN);
        putpixel(x1-y,y1-x,GREEN);
        x=x+1;
        if(d<0)
        {
            d = d+2*(x)+3;
        }
        else
        {
            d = d+2*(x-y)+5;
            y=y-1;
        }
    }
}

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    }
    delay(20);
}

}

int main()
{
    float x1,y1,r;
    initwindow(800,600);

    int ch;
    cout << "1. Bresenham's Algorithm\n";
    cout << "2. MidPoint Algorithm\n";
    cout << "0. Exit\n";
    cout << "Enter the option: ";
    cin >> ch;
    switch(ch)
    {
        case 1:
            cout << "Enter the center:";
            cin >> x1 >> y1;
            cout << "Enter the radius:";
            cin >> r;
            BresenhamCircle(x1,y1,r);
            break;
        case 2:
            cout << "Enter the center:";
            cin >> x1 >> y1;
            cout << "Enter the radius:";
            cin >> r;
            MidPoint(x1,y1,r);
            break;
        default:
            exit(1);
    }

    getch();

    return 0;
}

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