CGL Assignment No 3: Write C++ program to draw the following pattern. Use DDA line and Bresenham drawing algorithm. Apply the concept of encapsulation.

```
#include<iostream>
#include<graphics.h>
#include <bits/stdc++.h>


using namespace std;

class algo
{
	public:
		void dda_line(float x1, float y1, float x2, float y2);
		void bresneham_cir(int r);
};

void algo::dda_line(float x1, float y1, float x2, float y2)
{
	float x,y,dx,dy,step;
	int i;
				//step 2
			dx=abs(x2-x1);
			dy=abs(y2-y1);
			cout<<"dy="<<dy<<"\tdx="<<dx;

			//step 3
			if(dx>=dy)
				step=dx;
			else
				step=dy;
			cout<<"\n"<<step<<endl;

			//step 4
			float xinc=float((x2-x1)/step);
			float yinc=float((y2-y1)/step);

			//step 5
			x=x1;
			y=y1;
	//		outtextxy(0,0,"(0,0)");

			//step 6
```

```
                        i=1;
                        while(i<=step)
                        {
                                //cout<<endl<<"\t"<<i<<"\t(x,y)=("<<x<<","<<y<<")";
                                putpixel(320+x,240-y,4);
                                x=x+xinc;
                                y=y+yinc;
                                i=i+1;
                        //      delay(10);
                        }

}


void algo::bresneham_cir(int r)
{
        float x,y,p;
                x=0;
                y=r;
                p=3-(2*r);
                while(x<=y)
                {
                        putpixel(320+x,240+y,1);
                        putpixel(320-x,240+y,2);
                        putpixel(320+x,240-y,3);
                        putpixel(320-x,240-y,5);
                        putpixel(320+y,240+x,6);
                        putpixel(320+y,240-x,7);
                        putpixel(320-y,240+x,8);
                        putpixel(320-y,240-x,9);
                        x=x+1;
                        if(p<0)
                        {
                                p=p+4*(x)+6;
                        }
                        else
                        {
                                p=p+4*(x-y)+10;
                                y=y-1;
                        }
//                      delay(20);

        }
}
```

```
int main()
{
	algo a1;
	int i;
	float r,ang,r1;
	initwindow(630,480);
	cout<<"Enter radius of circle";
	cin>>r;
	a1.bresneham_cir((int)r);
	ang=3.24/180;
	float c=r*cos(30*ang);
	float s=r*sin(30*ang);
	a1.dda_line(0,r,0-c,0-s);
	a1.dda_line(0-c,0-s,0+c,0-s);
	a1.dda_line(0+c,0-s,0,r);
	r1=s;
	a1.bresneham_cir((int)r1);
	getch();
	closegraph();
	return 0;

}
```