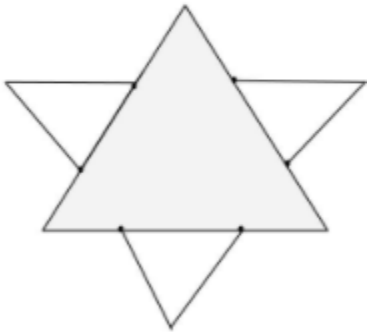
Aim: To implement Fractal (Koch Curve).

Objective:
A Koch curve is a fractal curve that can be constructed by taking a straight-line segment and replacing it with a pattern of multiple line segments. Then the line segments in that pattern are replaced by the same pattern.

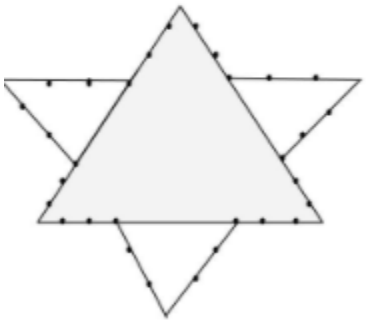
Theory:
1) Draw an equilateral triangle.

2) Divide each side in three equal parts.

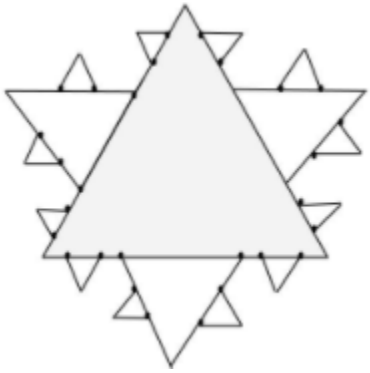
3) Draw an equilateral triangle on each middle part. Measure the length of the middle third to know the length of the sides of these new triangles.



4) Divide each outer side into thirds. You can see the 2nd generation of triangles covers a bit of the first. These three line-segments shouldn't be parted in three.



5) Draw an equilateral triangle on each middle part.

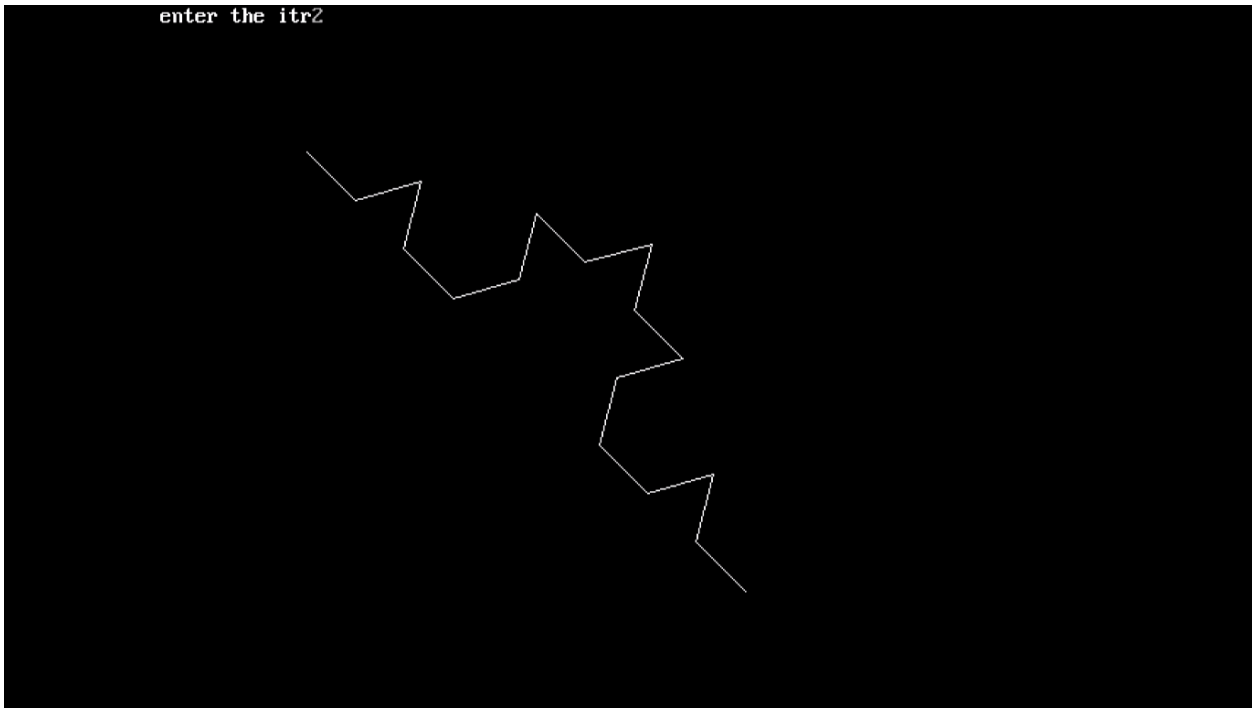


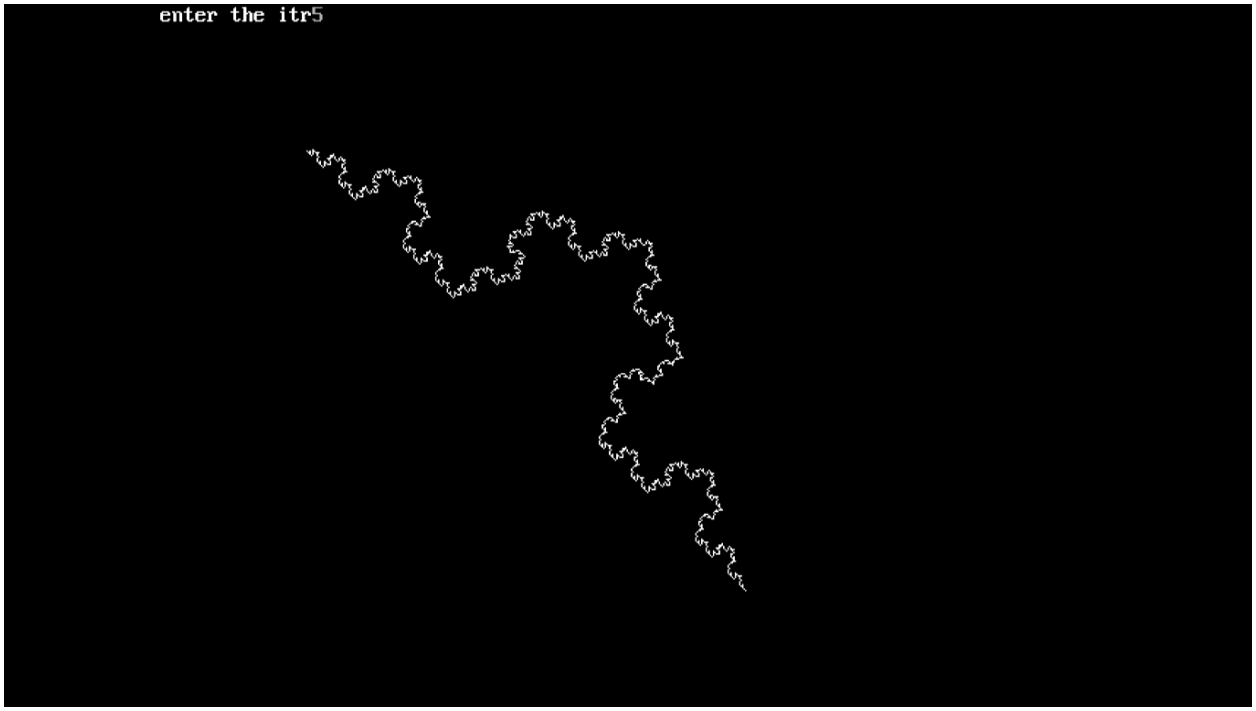
Program:

```
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
#include<math.h>
void koch(int,int,int,int,int);
void main()
{
int gd= DETECT, gm, a;
int i,x1=100,y1=100,x2=400,y2=400;
initgraph(&gd,&gm,"C:\\TURBOC3\\BGI");
printf("enter the itr");
scanf("%d",&a);
for(i=0;i<a;i++)
{
koch(x1,y1,x2,y2,a);
getch();
```

```
}
closegraph ();
}
void koch(int x1,int y1,int x2,int y2,int itr)
{
float angle = 60*3.14/180;
int x3=(2*x1+x2)/3;
int y3=(2*y1+y2)/3;
int x4=(x1+2*x2)/3;
int y4=(y1+2*y2)/3;
int x=x3+(x4-x3)*cos(angle)+(y4-y3)*sin(angle);
int y=y3-(x4-x3)*sin(angle)+(y4-y3)*cos(angle);
if (itr>0)
{
koch(x1,y1,x3,y3,itr-1);
koch(x3,y3,x,y,itr-1);
koch(x,y,x4,y4,itr-1);
koch(x4,y4,x2,y2,itr -1);
}
else {
line(x1,y1,x2,y2);
}
}
```

Output:


enter the itr2


enter the itr5

Conclusion - Comment on

1. Difference from Bezier Curve:- A Bezier curve and a B-spline (or simply spline) curve are both mathematical representations used in computer graphics and design, particularly in modeling and controlling the shapes of curves and surfaces.
2. Application:- Bezier curves and B-spline curves have numerous applications in computer graphics, design, engineering, and various other fields. Their ability to define and control curves and surfaces makes them versatile tools for shaping and modeling objects.