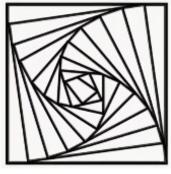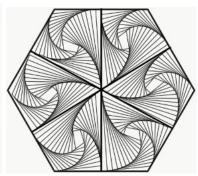| **14350 Computer Graphics**	Assignment 1 - 06/Oct/2023

<div align="center">

Plotting 2D Fractals using Modern OpenGL

</div>

Supervisor: ██████████   *Scribe:* ██████████

The goal of this assignment is plotting 2D fractals from convex figures (e.g., a square), as illustrated in Fig. **??**. For that purpose, we first need to sample the sides of the convex figure using linear interpolation. Such samples of the target fractal constitute a sequence of 2D points. These points must stored into a point array in order to sent it to the graphics card. The OpenGL primitive to be used is the GL_LINES.

(a) Quadrangle fractal with base 4.   (b) Hexagon fractal with base 4.

Figure 1: Two convex fractals generated by linear interpolation.

1 Reference Code

An example that illustrates the sampling process is the one concerning the drawing of the circumference at: ██████████████████████████████████ To learn how to use parametric linear interpolation is the process sampling, please refer to: `https://en.wikipedia.org/wiki/Linear_interpolation`.

2 Who does what?

The first digit (the one furthest to the right) of the student number identifies the exercise he/she has to solve. See next section to make sure about your assignment.

3 Exercises

0. Pentagon fractal (base convex figure is the triangle).

1. Hexagon fractal (base convex figure is the triangle).

2. Heptagon fractal (base convex figure is the triangle).

3. Octagon fractal (base convex figure is the triangle).

4. Nonagon fractal (base convex figure is the triangle).

5. Pentagon fractal (base convex figure is the quadrangle).

6. Hexagon fractal (base convex figure is the quadrangle).

7. Heptagon fractal (base convex figure is the quadrangle)

8. Octagon fractal (base convex figure is the quadrangle).

9. Nonagon fractal (base convex figure is the quadrangle).

References

[1] Shivam Arts about fractals: `https://www.youtube.com/watch?v=dfvSulD311Y`

[2] Linear interpolation: `https://en.wikipedia.org/wiki/Linear\_interpolation`

[3] The OpenGL Shading Language `https://www.opengl.org/registry/doc/GLSLangSpec.4.40.pdf`, last access on 08/04/2015.

[4] Dave Shreiner, Graham Sellers, John Kessenich, and Bill Licea-Kane. OpenGL Programming Guide, 8th edition, version 4.3. Addison-Wesley, Upper Saddle River, 2013.