Mission Sidequest 6.1: Kochize

Start date: 6 September 2017
Due: 14 September 2017, 23:59

Readings:

- Textbook Sections 1.3.2

In this sidequest, we shall take the drawing of fractals to the next level, utilizing a mathematical curve known as the Koch curve to aid in our drawing of a snowflake.

This side quest consists of **two** tasks. Click here for the link to the template.

Task 1:

We shall utilize the mathematical concept of a Koch curve in aiding our drawing of the snowflake. We begin by drawing part of the snowflake.

Figures below show the first few approximations to the Koch curve, where we stop after a certain number of levels: a level-0 curve is simply a straight line; a level-1 curve consists of four level-0 curves; a level-2 curve consists of four level-1 curves, and so on. The figures illustrate a recursive strategy for making the next level of approximation: a level-n curve consists of three parts. The first part is a level-(n-1) curve. The second part consists of two level-(n-1) curves, one is rotated by $\pi/3$ and the other is rotated by $-\pi/3$. The last part is another level-(n-1) curve.

Define a function `show_connected_koch` such that the evaluation of

`show_connected_koch(level, number_of_points);`

will show `number_of_points` connected points of the level `level` koch curve starting with a `unit_line` at level 0.

```
show_connected_koch(0, 1000);
```



```
show_connected_koch(1, 1000);
```

```
show_connected_koch(2, 4000);
```



```
show_connected_koch(5, 4000);
```

Task 2:

By completing **Task 1**, you have one third of your snowflake in hand. Now construct your complete snowflake using a **level-5** Koch curve and tools you have learned in previous missions. Precisely, define `snowflake` such that

`(draw_connected_full_view_proportional(10000))(snowflake)`

displays your snowflake within the viewport.

[Note: `draw_connected_full_view_proportional` scales proportionally and translates your curve to the center.]

An example is shown below.
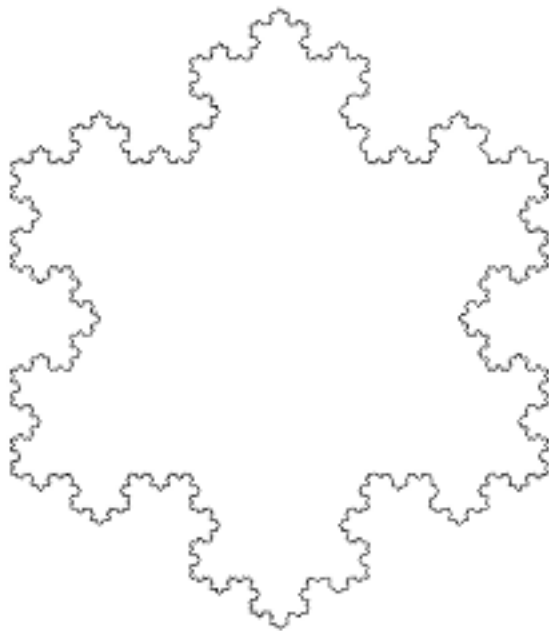
`(draw_connected_full_view_proportional(10000))(snowflake)` displays the snowflake above.

Submission

To submit your work for this mission, copy the url on your browser and email it to your respective Avengers. Strictly follow to the deadlines set at the start of this file.

IMPORTANT: Make sure that everything for your programs to work is on the left hand side and **not** in the interpreter pane on the right! This is because only that program is preserved in the url you have emailed to us.