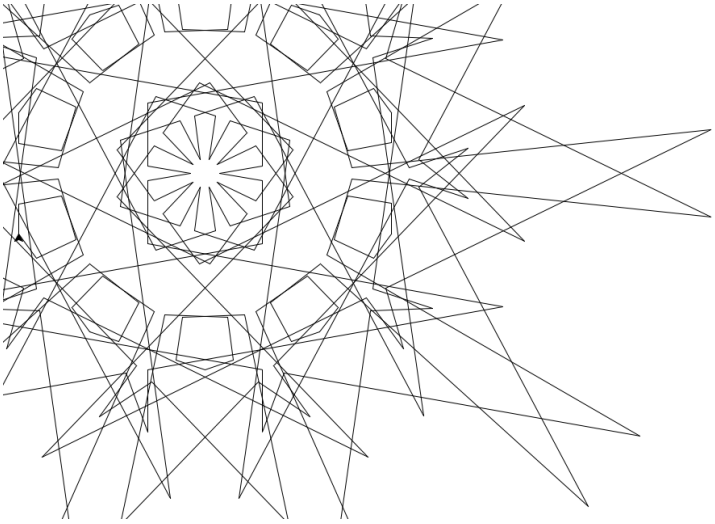
Computational Problem Solving CSCI-603
Sun Star Lab 3

6/3/2021



In your programming assignment you will be developing a graphical application that draws patterns in the turtle window using recursive techniques.

1 Problem Solving Session

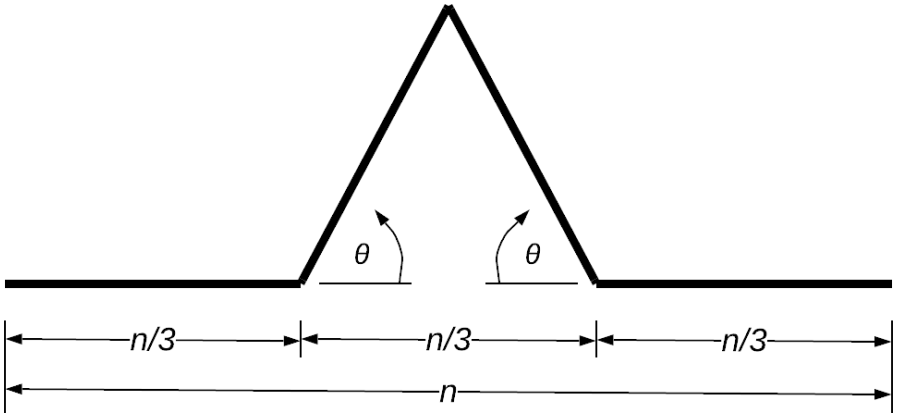


Figure 1. Specification for one side of a Koch Snowflake drawing at level 2

1. Write a simple function `draw_side1(n: int)` that draws a straight line. `n` is the length of the line. As preconditions, the turtle will be facing east with the pen down, and the post conditions are that the turtle is left at the end of the drawing just done, pen down.
2. Write a function `draw_side2(n: int)` that draws the lines shown in Figure 1. `n` is the horizontal length of the entire drawing. Assume that θ is a fixed angle of $60°(\pi/3$ radians). To draw the second segment, you must replace it by calling twice `draw_side1` with the correct length.
3. Now create your recursive function `draw_side` that takes a length and level parameters. `level` is always positive (not even zero). The behavior should be:
   - If the level is 1, the image from `draw_side1` should be drawn.
   - If the level is 2, the image from `draw_side2` should be drawn.
   - If the level is 3, Figure 2 below should be drawn.
   - If the level is 5, Figure 3 below should be drawn.

   Note: You are not allowed to call `draw_side1` nor `draw_side2`.

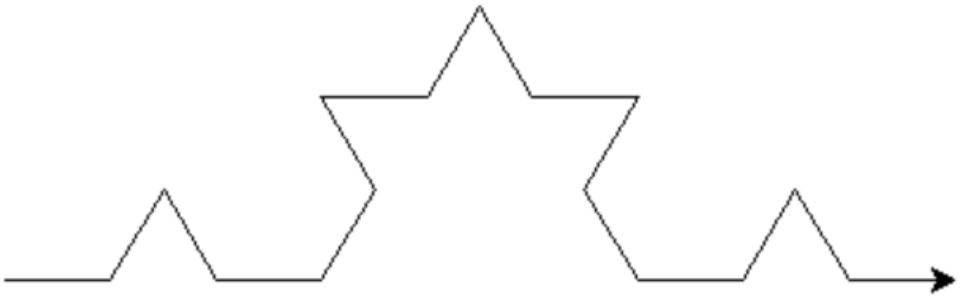


Figure 2. `level` = 3

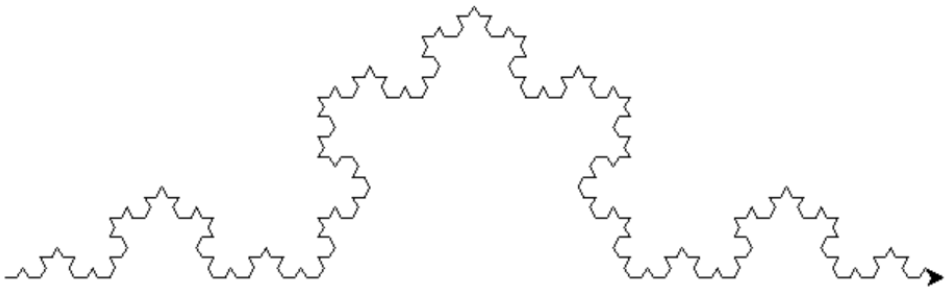


Figure 3. `level` = 5

4. Finally, change `draw_side(n,level)` so that it returns the complete (cumulative) length of all the lines drawn. The total length must be computed recursively rather than with a closed formula.

At the end of problem-solving, put all group members' names on the sheet, number each item and hand in your work, one copy per team.