

Homework 2 hints

To work on homework 2, start from the program we discussed in class <https://www.cs.mtsu.edu/~cen/4250/private/webgl-code/demo/10-gasket2.html>, and <https://www.cs.mtsu.edu/~cen/4250/private/webgl-code/demo/10-gasket2.js>

This program produces a Sierpinski Gasket as shown in Figure (a) using recursion. Read through the program and understand how the recursion in the program defines the vertices for all the triangles in the figure.

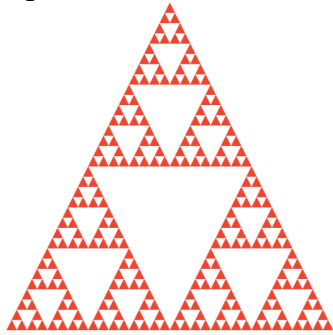


Figure (a)

Now modify the program to twist/modify the vertices (i.e., vertices defining the individual small triangles that form the overall shape) using the formula shown below. This means for each vertex having coordinate values (x, y) , the new coordinates after twisting is (x', y') using the formula shown below.

$$x' = x * \cos(d * \theta) - y * \sin(d * \theta)$$

$$y' = x * \sin(d * \theta) + y * \cos(d * \theta)$$

where

$$d = \sqrt{x^2 + y^2}$$

This modification should lead to an output shape like the one shown in Figure (b). You need to define a theta value (θ) that determines the amount of twist to perform for each vertex. Experiment with a number of theta value to determine the optimal value to use.

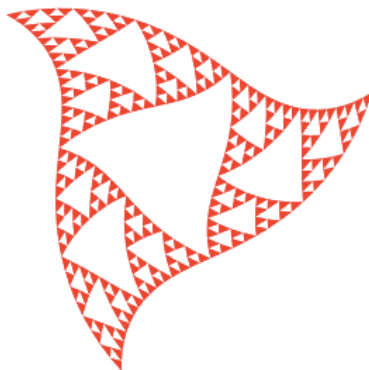


Figure (b)

Now, to complete the assignment, think about how you can fill the white empty spaces in the figure. You may want to look at the recursion part of the code more closely for this step. Once the white spaces are filled, your program should generate a figure like this:



Figure (c)

If you have difficulty with the assignment, feel free to come ask about it during the office hour.