# GETTING GENERATIVE WITH P5.JS

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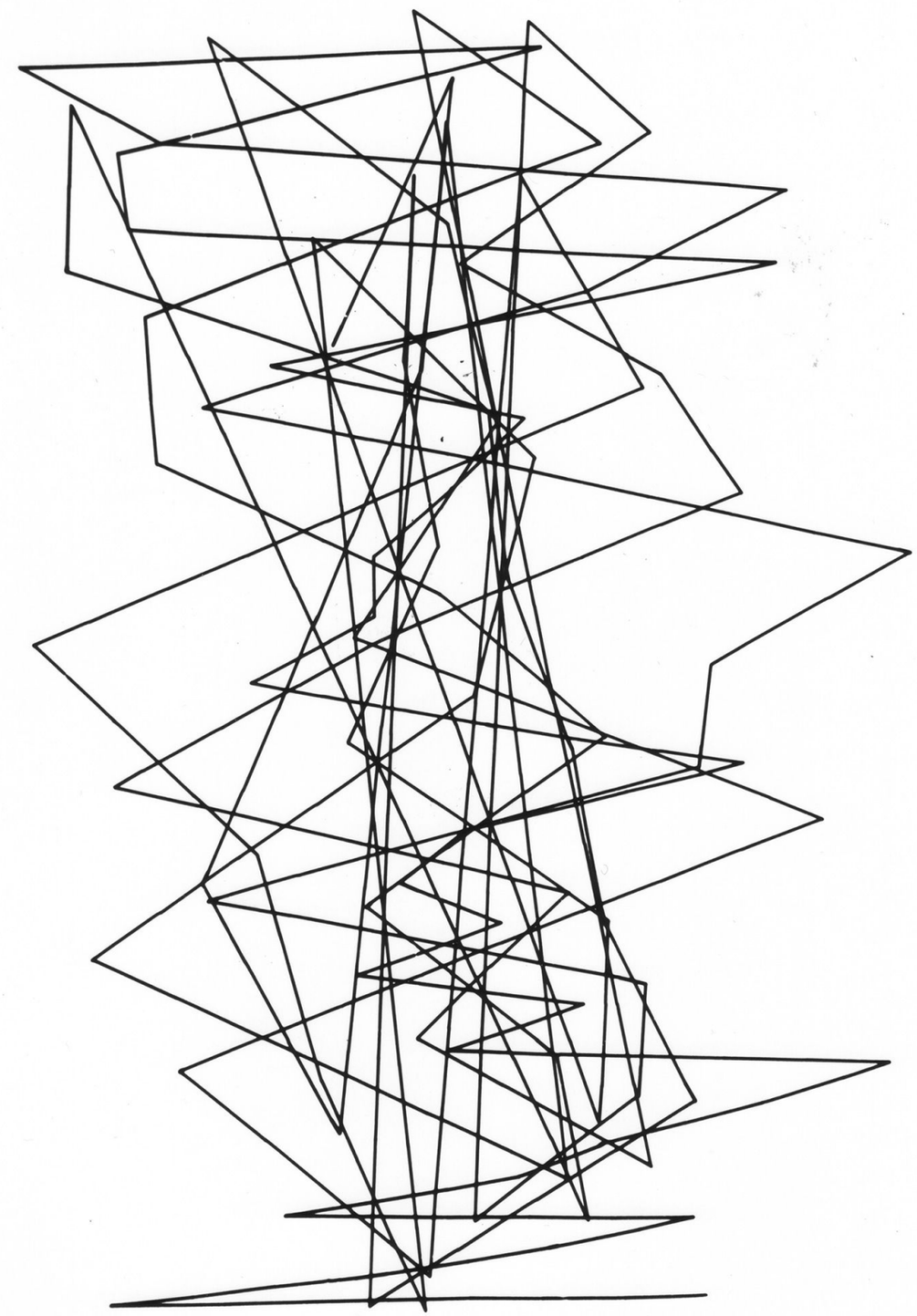
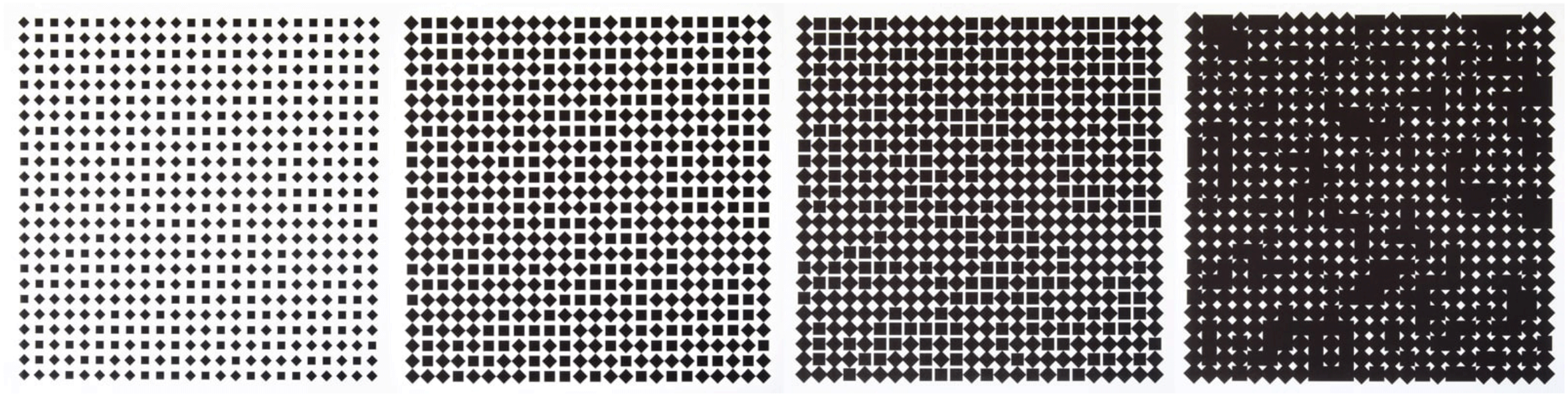
SHEUNG WAN, HK
FEBRUARY 16, 2019



GAUSSIAN-QUADRATIC (1963)
BY A. MICHAEL NOLL

# SLIDES & CODE

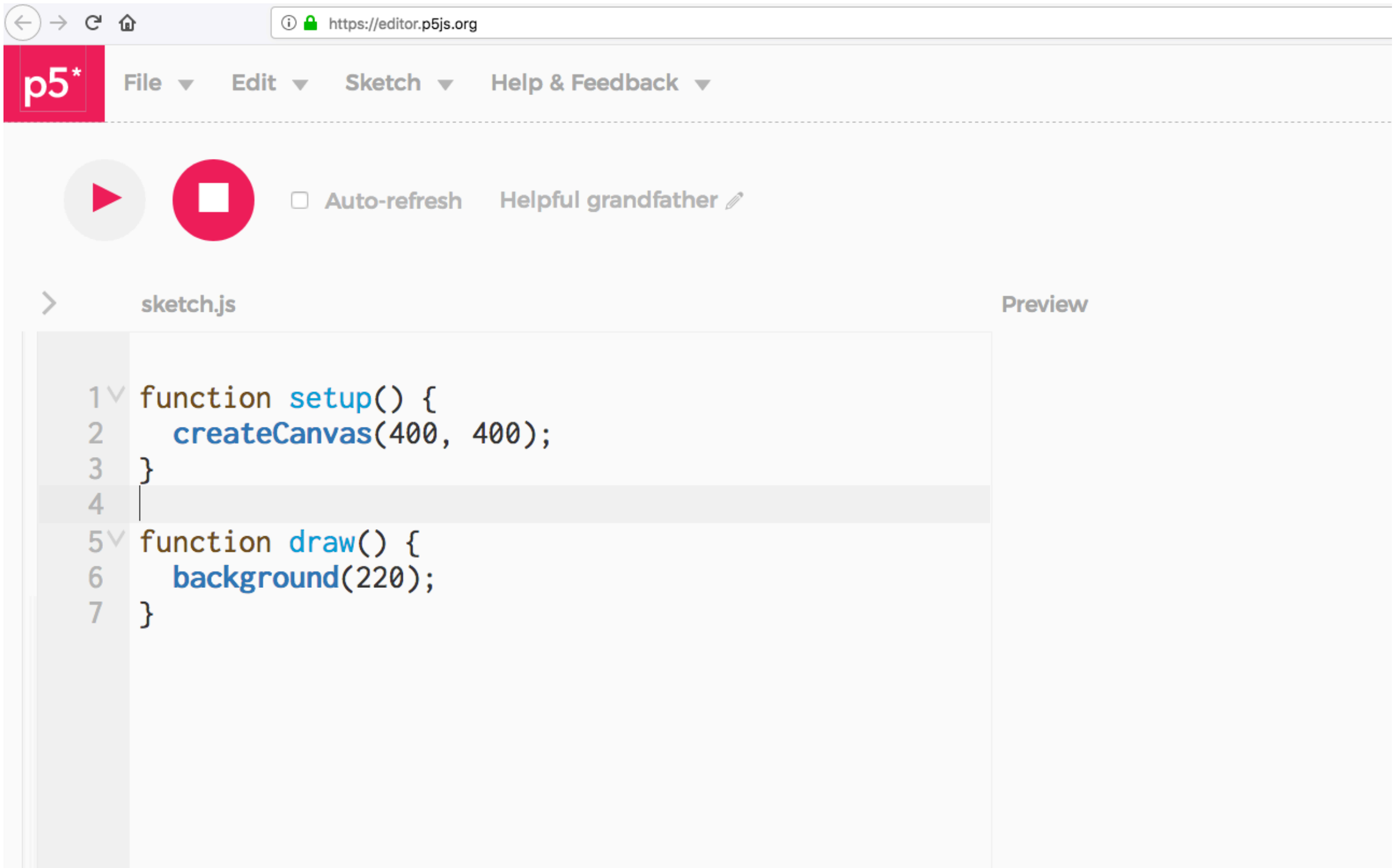
https://github.com/dhowe/GetGen



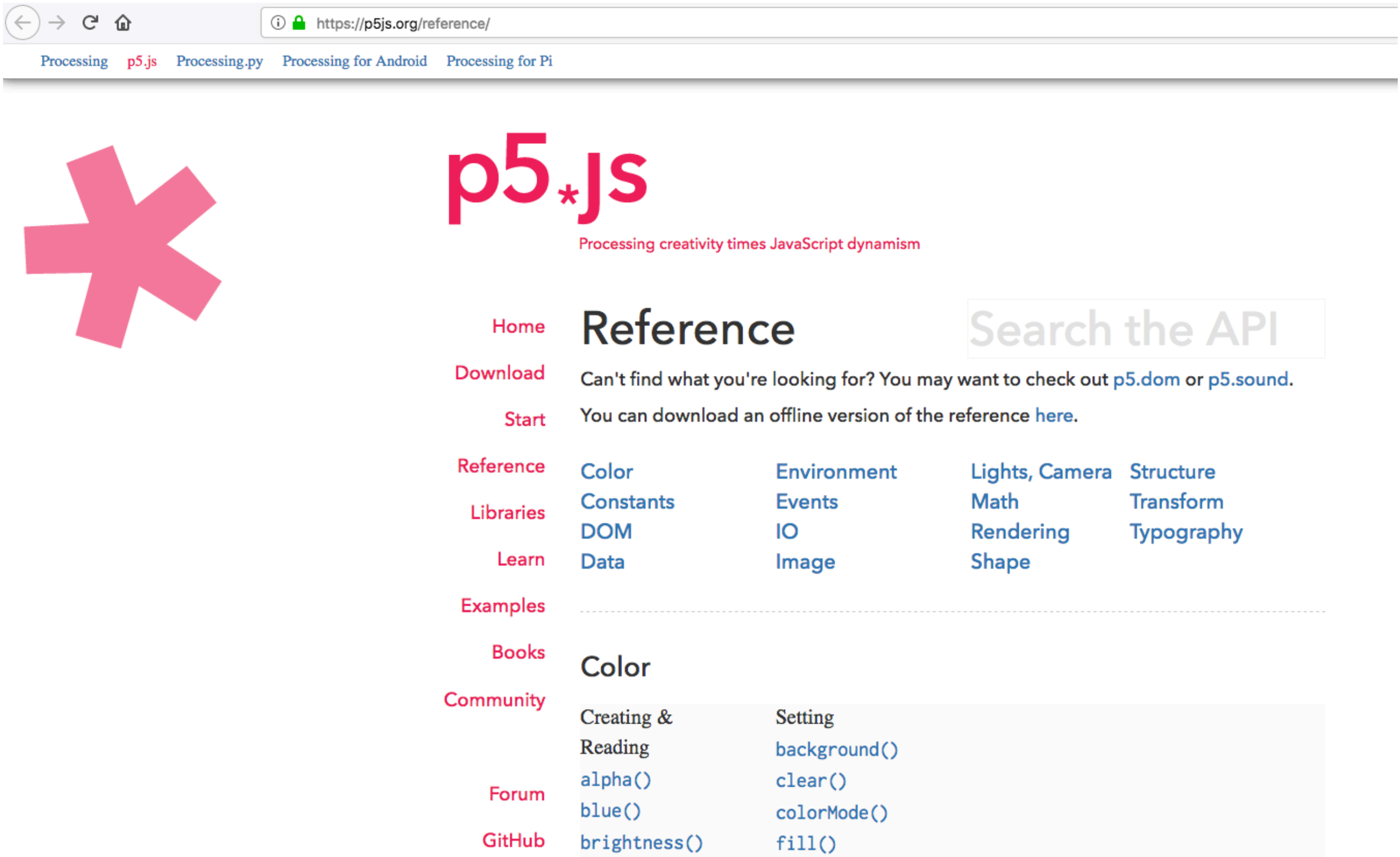
VERA MOLNAR, CARRÉS EN 2 POSITIONS 1/2/3/4 , 2011-13

# RECURSION
# FRACTALS
# AFFINE TRANSFORMS
# RANDOM
# NOISE

# TOOLS: P5.JS EDITOR



# TOOLS: REFERENCE



[WHEN] THE ARTIST USES A SYSTEM, SUCH AS A SET OF NATURAL LANGUAGE RULES, A COMPUTER PROGRAM, A MACHINE, OR OTHER PROCEDURAL INVENTION, WHICH IS SET INTO MOTION WITH SOME DEGREE OF AUTONOMY CONTRIBUTING TO OR RESULTING IN A COMPLETED WORK OF ART

# GENERATIVE ART

PHILIP GALANTER, 2003

# RECURSION

IMAGE BY JAN MISSET
FOR DROSTE CACAA, 1904

**re·cur·sion** /ri-ˈkər-zhən/

n. When an entity is defined by one or more references to itself.

# RECURSION

DANIEL HOWE, 2019

**re·cur·sion** /ri-ˈkər-zhən/

n. See recursion.

# RECURSION

URBAN DICTIONARY, 2019

# EXAMPLE: FACTORIAL

1! = 1

2! = 2 * 1 = 2

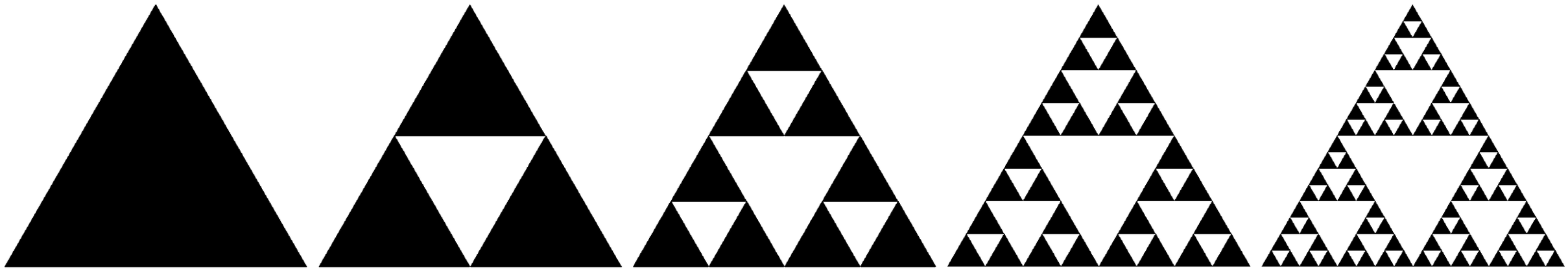
3! = 3 * 2 * 1 = 6

4! = 4 * 3 * 2 * 1 = 24

5! = 5 * 4 * 3 * 2 * 1 = 120

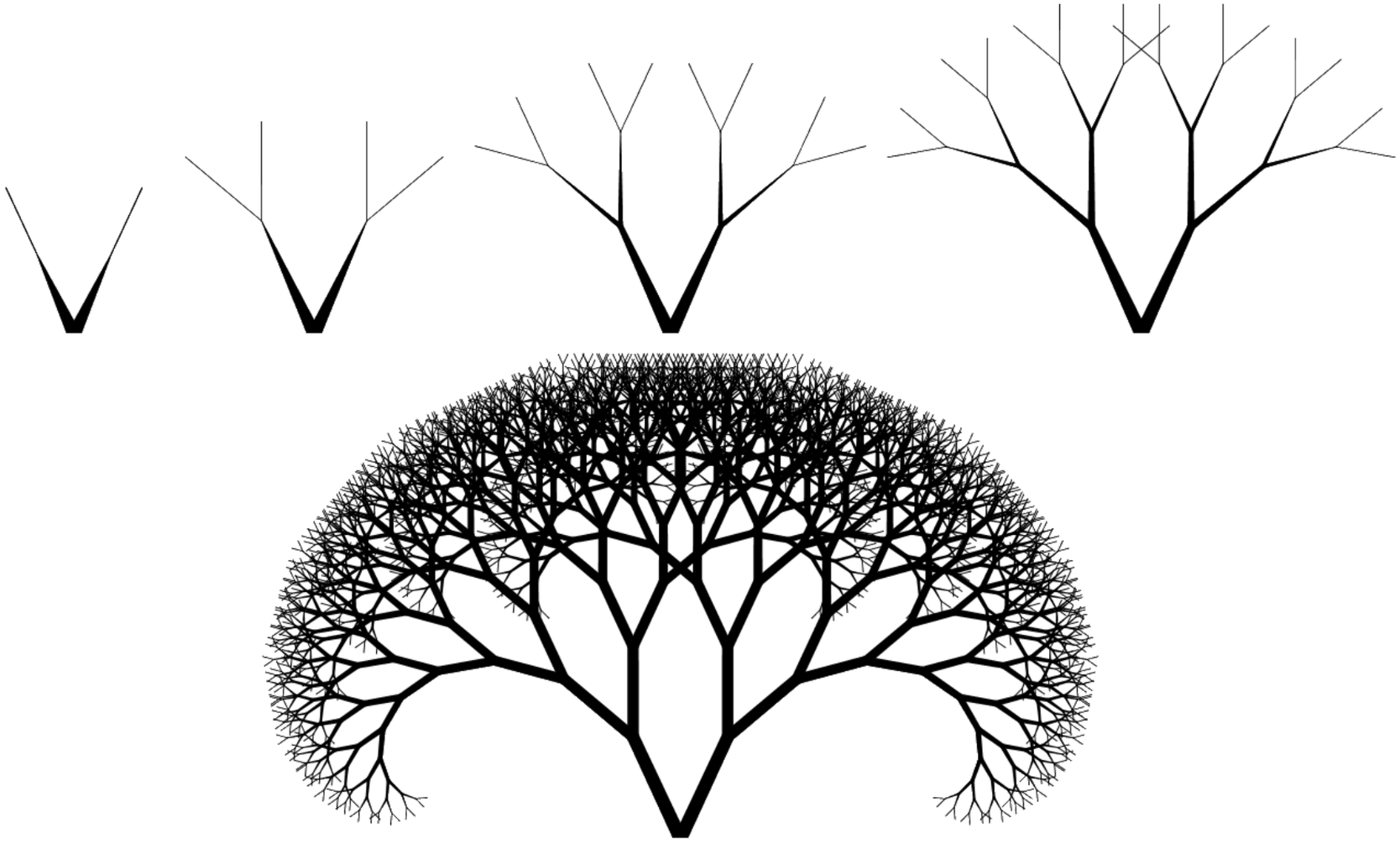
How can we define factorial() recursively ?

# EXAMPLE: SIERPINSKI TRIANGLE



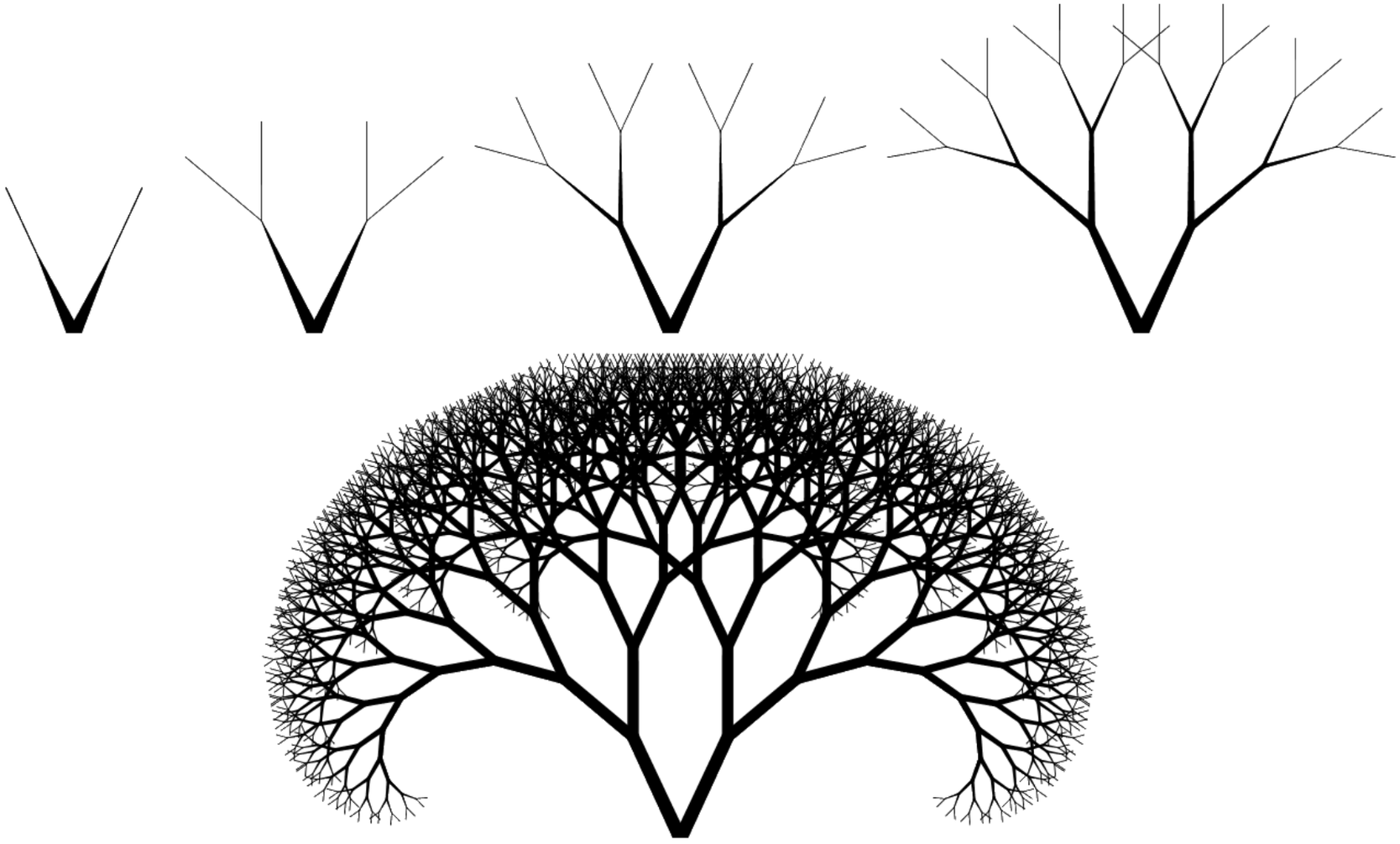
Make a new triangle from the 3 midpoints of the sides of the current triangle. Repeat for each of the three newly created triangles...

# EXAMPLE: FRACTAL TREE



Draw a branch. From its end, rotate right and draw a shorter branch. Then rotate left and do the same. Repeat for the two new branches...

# EXAMPLE: FRACTAL TREE



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# A NEW WAY TO DRAW SHAPES

**There are two basic ways of drawing shapes in p5.js:**

1) Position the shapes where we want them

2) Move the paper & draw shapes at the origin (0,0)

translate()

rotate()

scale()

# AFFINE TRANSFORMATIONS

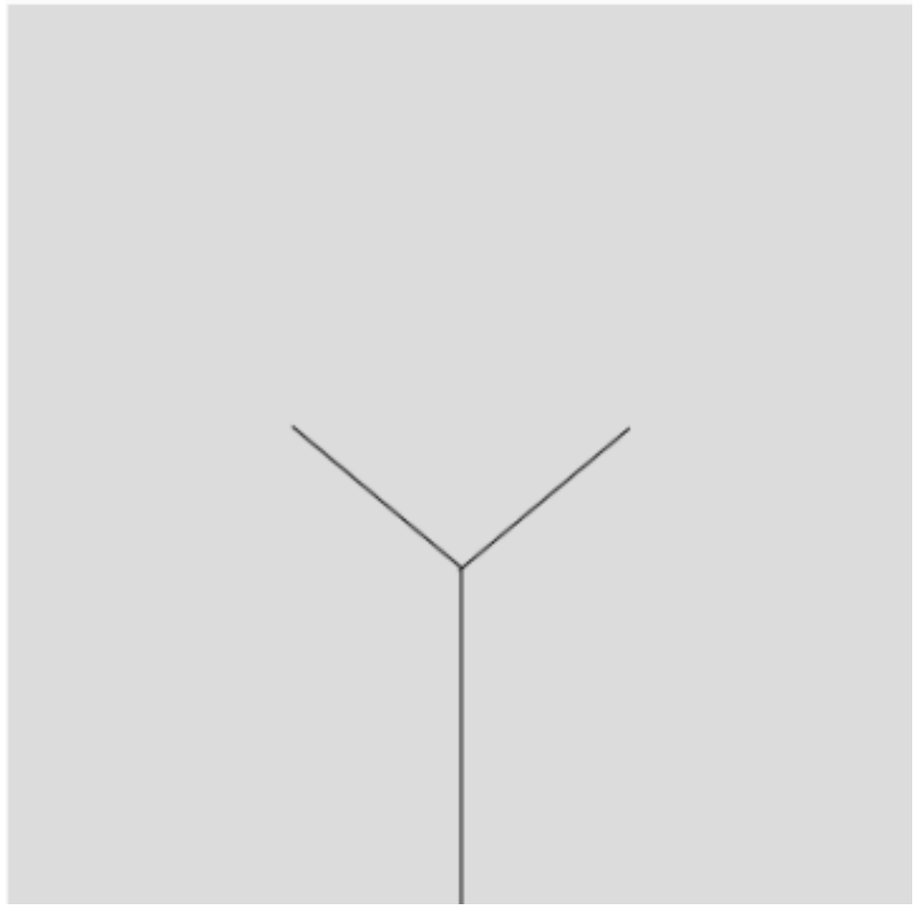
Functions that (essentially) move the 'graph paper':

translate() → move left/right or up/down

rotate() → rotate around the y-axis ( 2D)

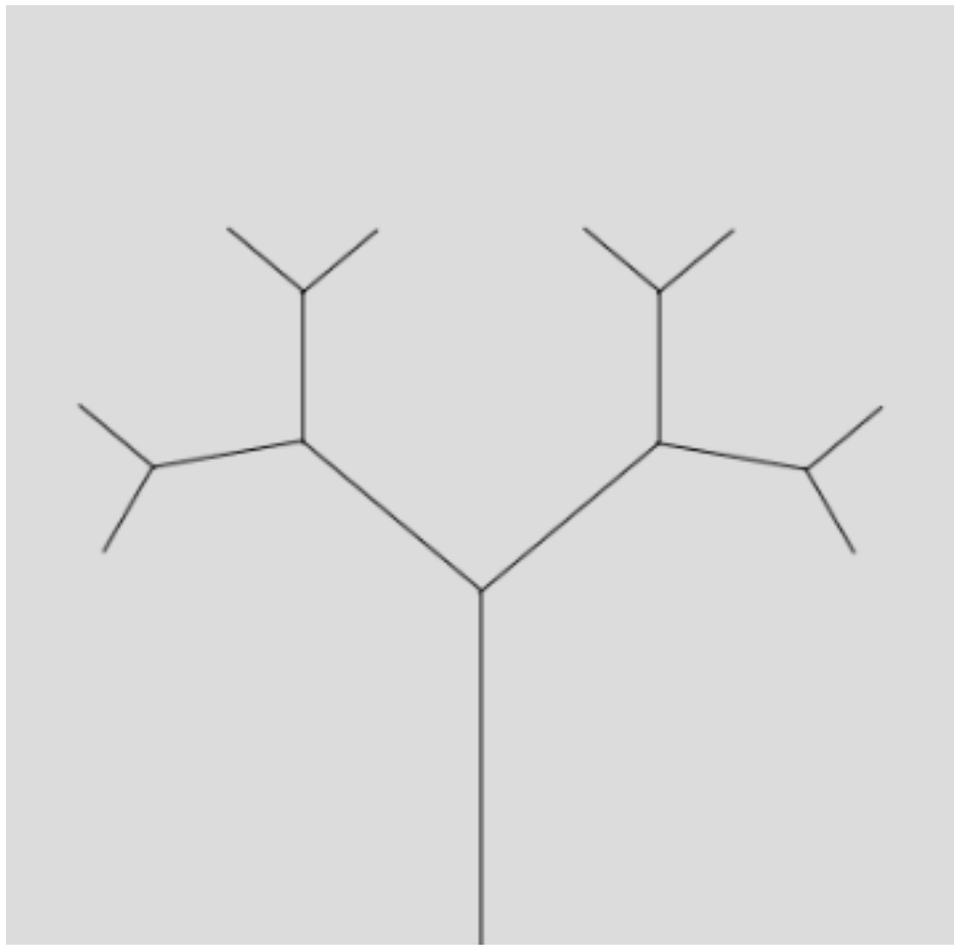
scale() → make bigger or smaller

# FRACTAL TREE



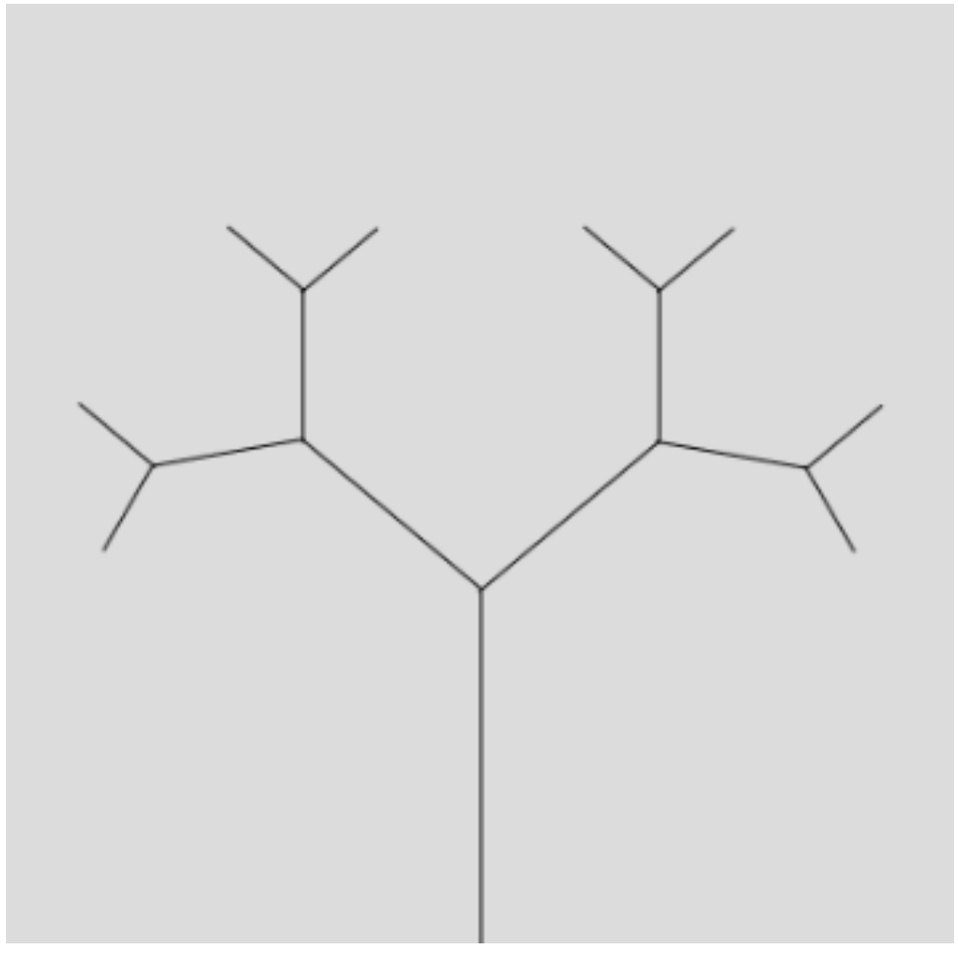
translate(), rotate(), line()

# FRACTAL TREE



now lets experiment with our variables: angle & lengthScale

# MAPPING THE MOUSE POSITION



we can map() the angle to mouseX
and the lenScale to mouseY

# THE MAP() FUNCTION

## Description

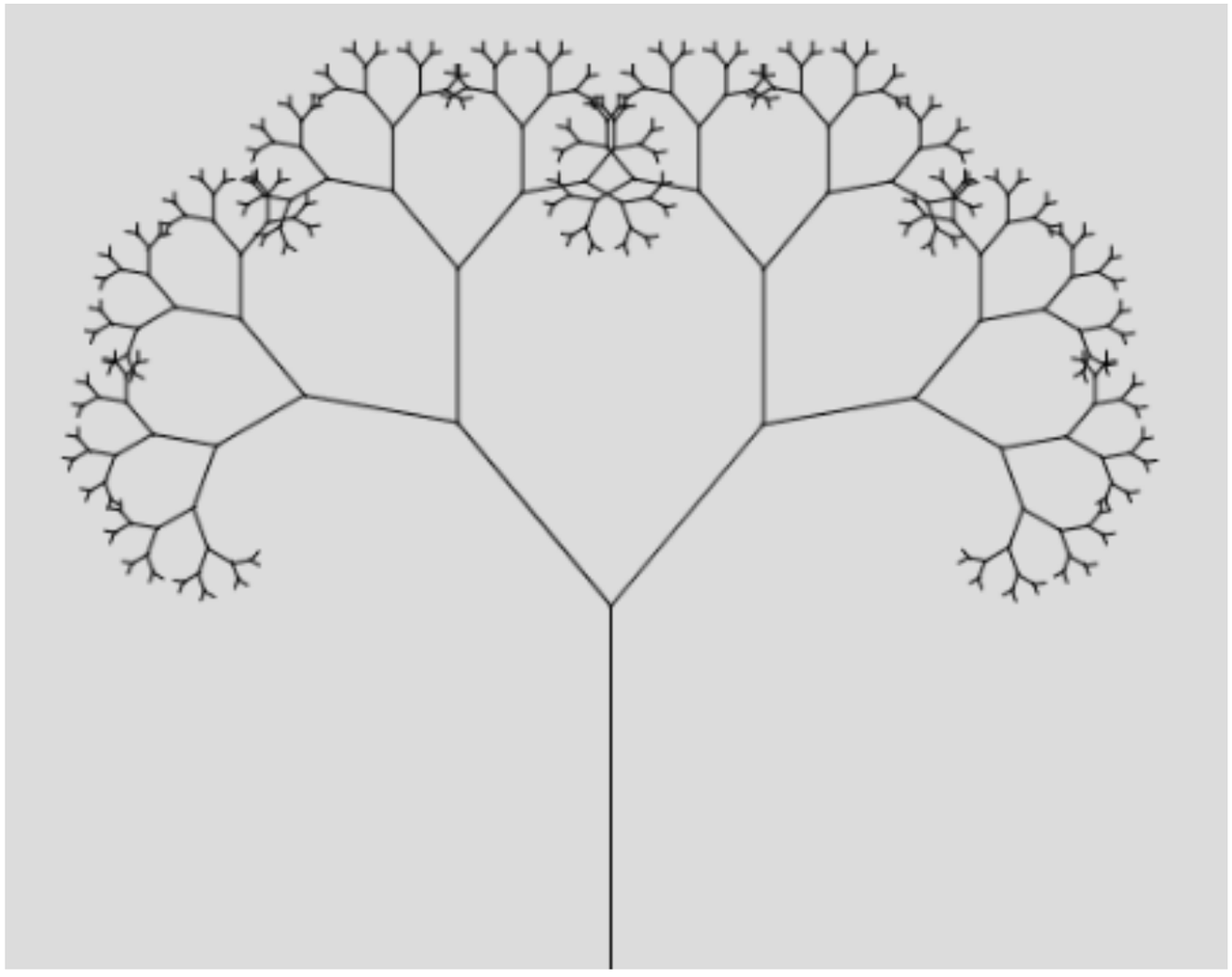
Re-maps a number from one range to another.

```
map(value, start1, stop1, start2, stop2);
```

## Parameters

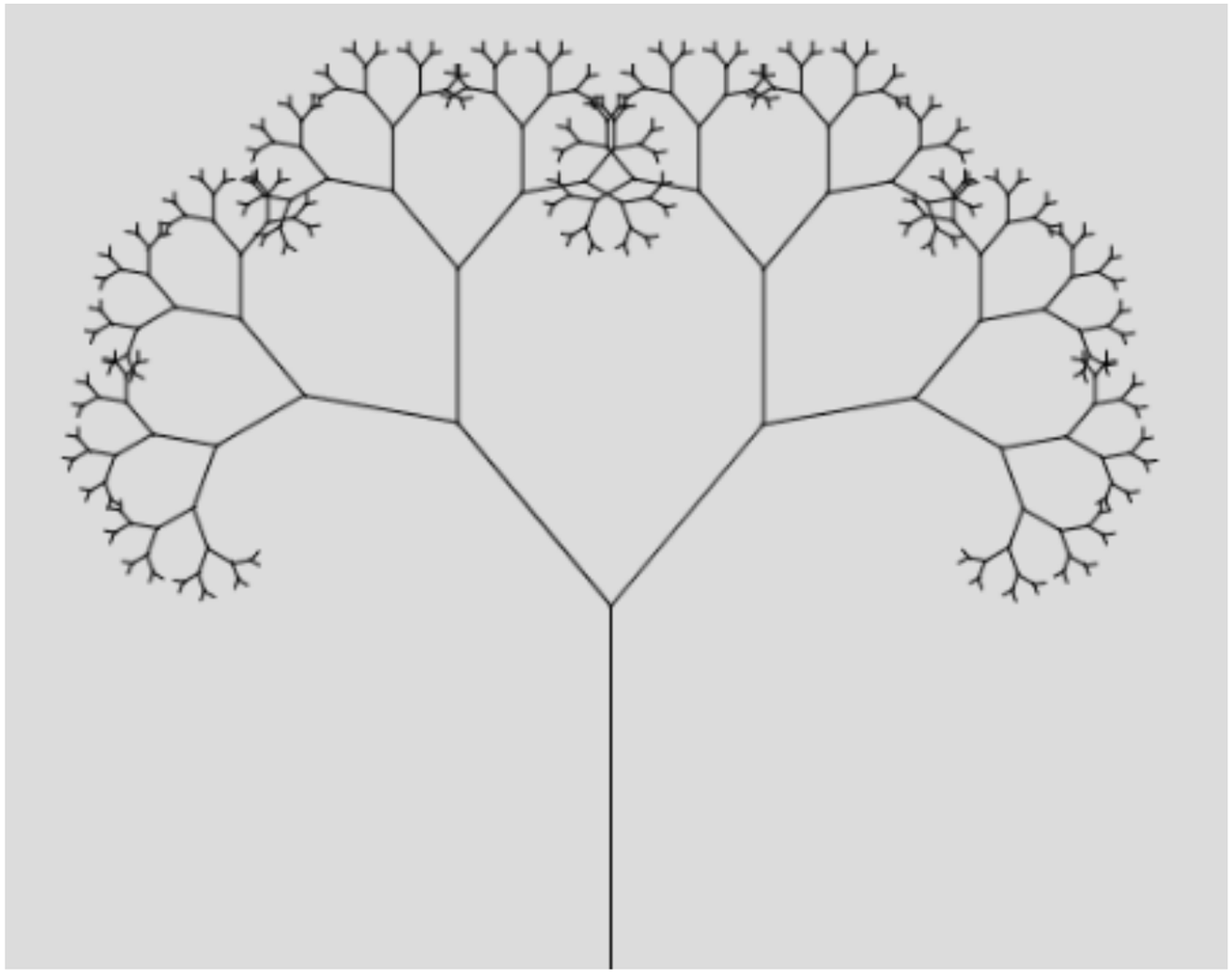
| | |
|---|---|
| `value` | Number: the incoming value to be converted |
| `start1` | Number: lower bound of the value's current range |
| `stop1` | Number: upper bound of the value's current range |
| `start2` | Number: lower bound of the value's target range |
| `stop2` | Number: upper bound of the value's target range |

# FRACTAL TREE



now lets use some random() variation to make it look more natural...

# FRACTAL TREE



now lets use some noise() to make it give it some natural motion...

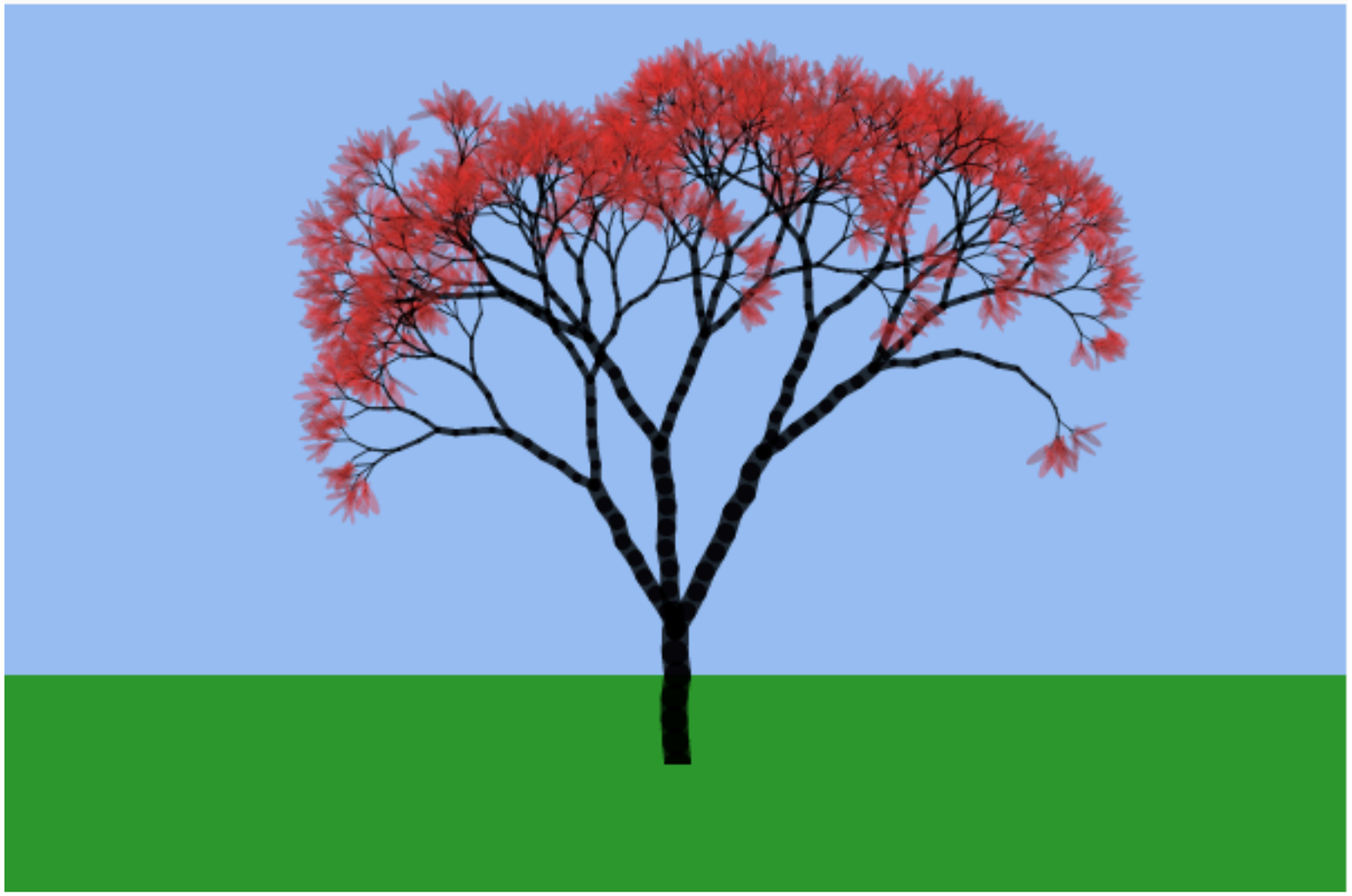
# THE NOISE() FUNCTION

## Description

Perlin noise is a random sequence generator producing a more natural ordered, harmonic succession of numbers compared to the standard random() function.

```
// 1d noise, 'value' should increase slowly
let n = noise(value);
```

# FRACTAL TREE



# END

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