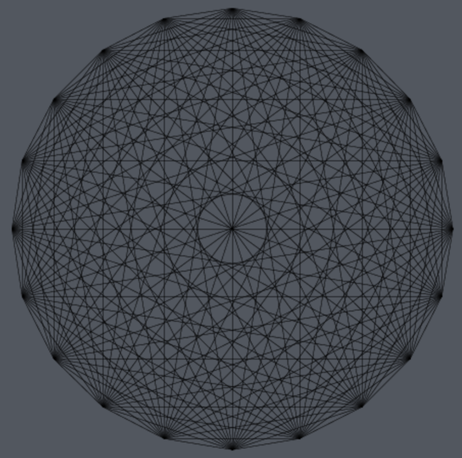


Recreational Programming

Anand Chitipothu

Who is Speaking?

Anand Chitipothu
@anandology

- Autodidact Programmer
- Building a data science platform at @rorodata
- Advanced programming courses at @pipalacademy
- Worked at Strand Life Sciences and Internet Archive

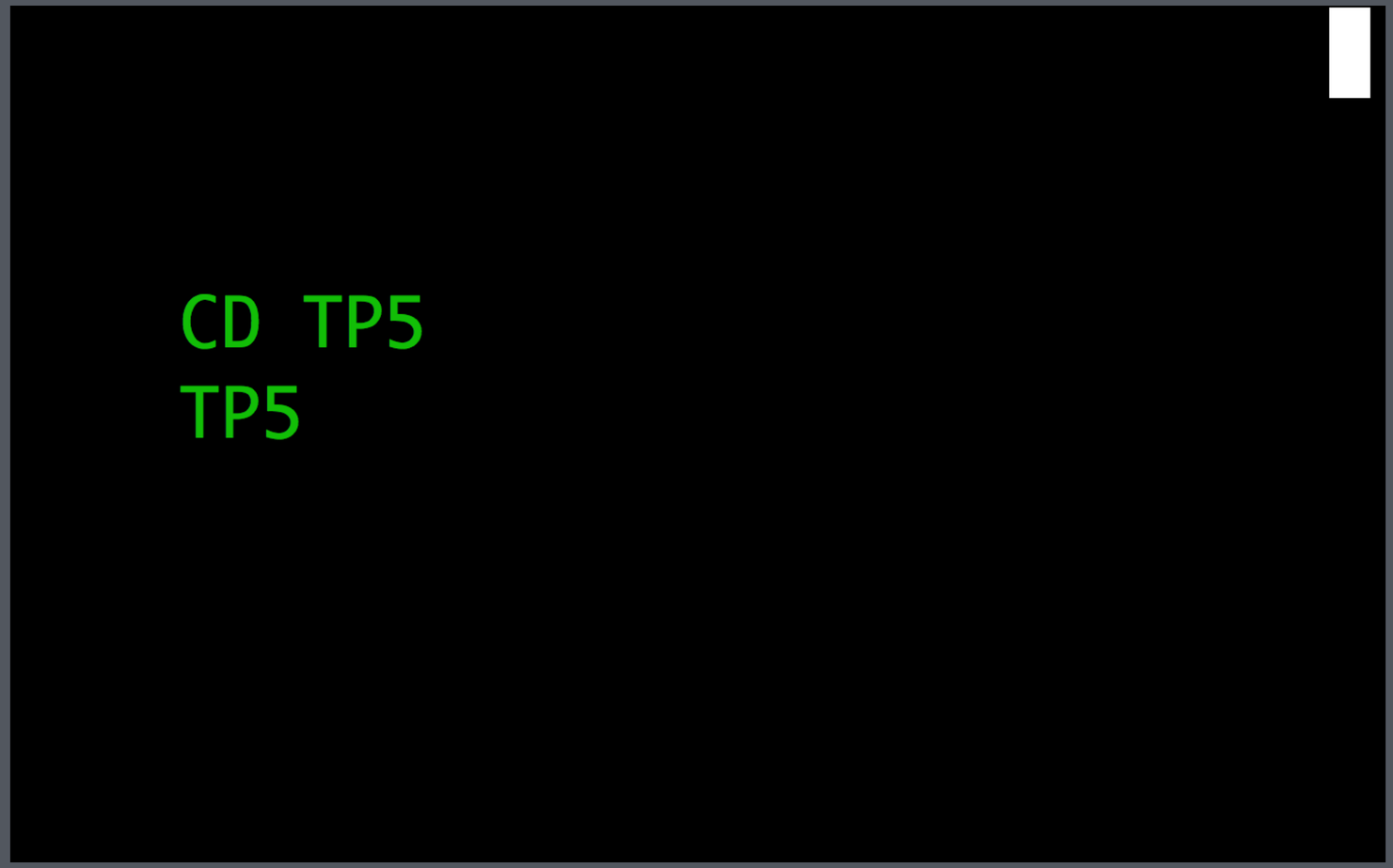
recreational |rɛkriˈeɪʃənl|
adjective

relating to or denoting activity done for enjoyment when one is not working

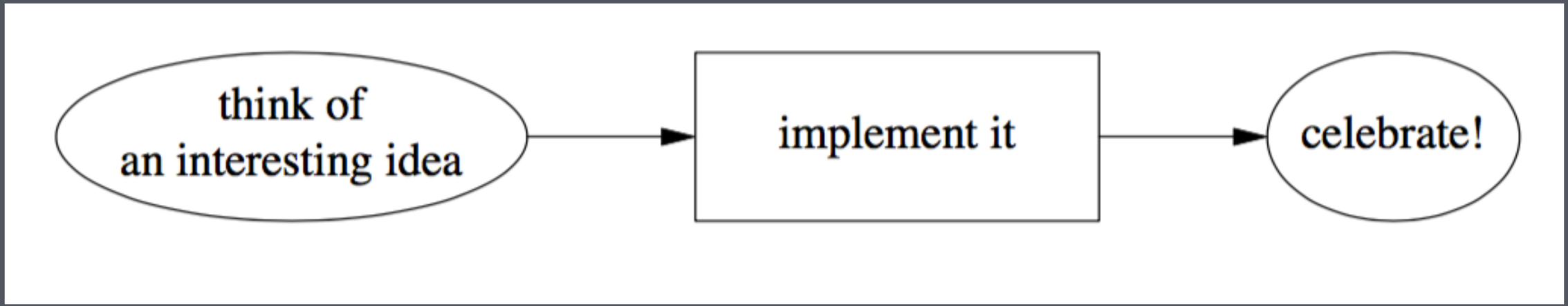
recreational programming

programming for the sheer joy of it!

This is How I Started Programming



This is How I Continued...



Interesting Ideas

1. Write Games

15 Puzzle

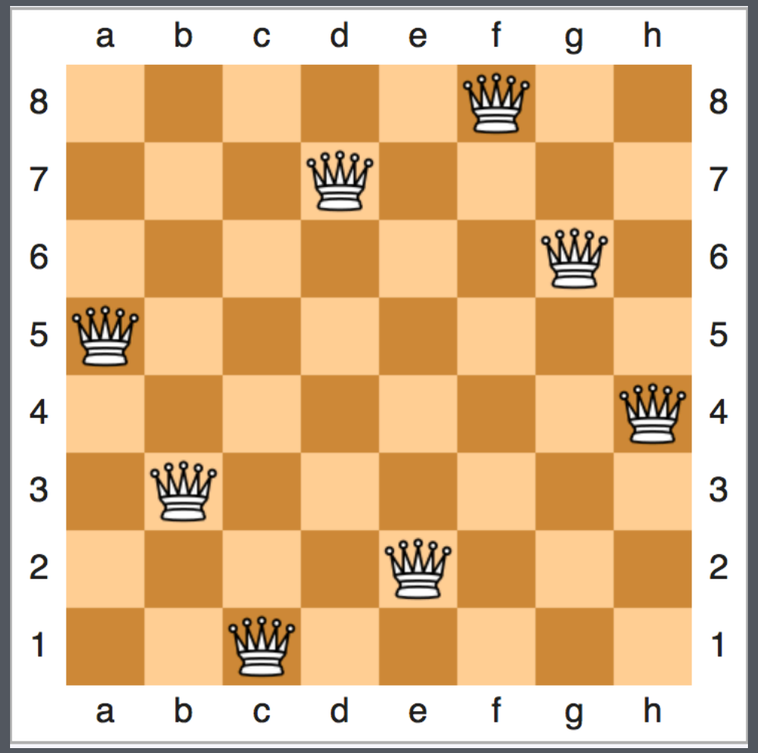
https://en.wikipedia.org/wiki/15_puzzle

2048

https://en.wikipedia.org/wiki/2048_(video_game)

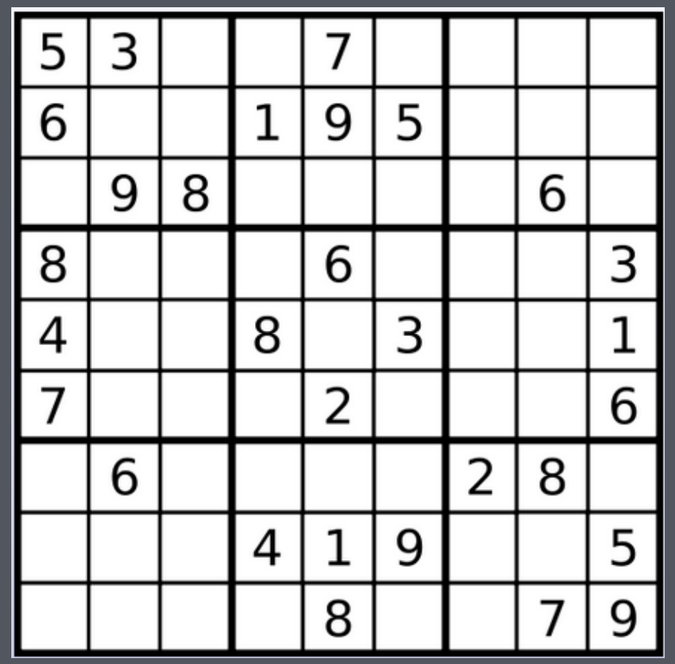
2. Solve Puzzles

Eight Queens Problem



https://en.wikipedia.org/wiki/Eight_queens_puzzle

Sudoku



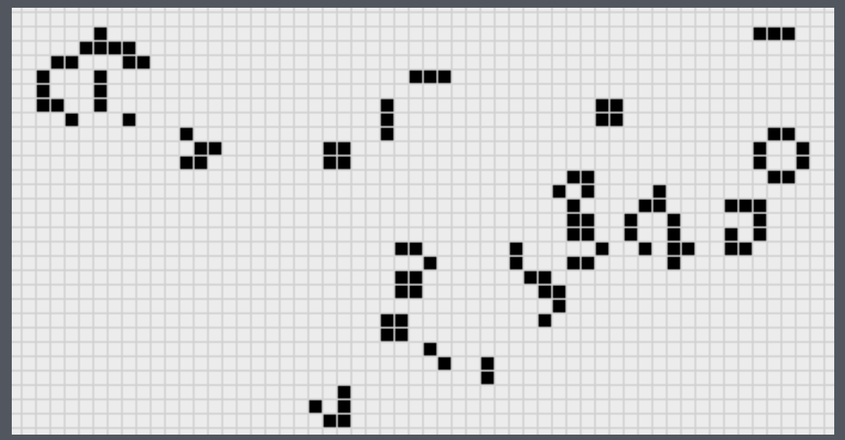
5	3			7				
6			1	9	5			
	9	8					6	
8				6				3
4			8		3			1
7				2				6
	6					2	8	
			4	1	9			5
				8			7	9

http://anandology.com/presentations/solving-puzzles-with-python/
http://norvig.com/sudoku.html

3. Game of Life

The Game

- infinite two-dimensional orthogonal grid of square cells
- each cell is either alive or dead



http://www.math.cornell.edu/~lipa/mec/banner.png

The Rules

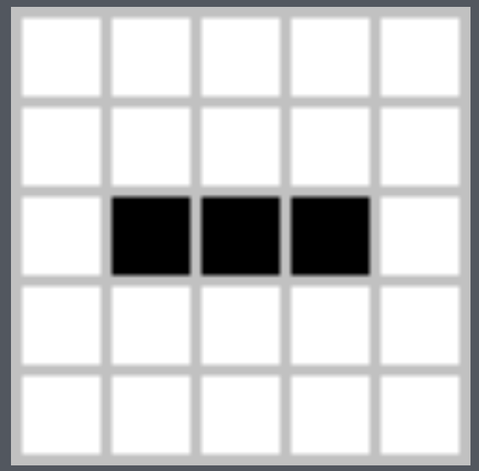
Any live cell with:

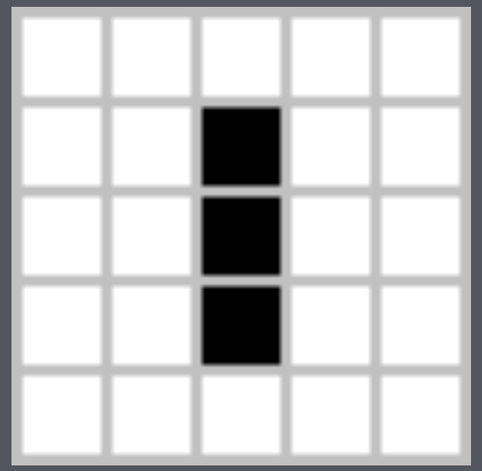
- fewer than two live neighbours dies - loneliness
- more than three live neighbours dies - overpopulation
- two or three live neighbours lives on - right living conditions

Any dead cell with:

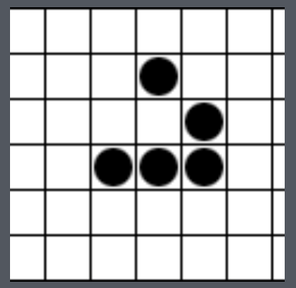
- exactly three live neighbours becomes a live cell, as if by reproduction.

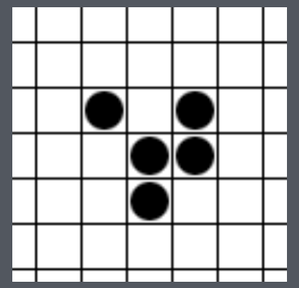
Interesting Patterns

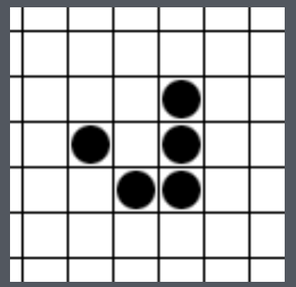


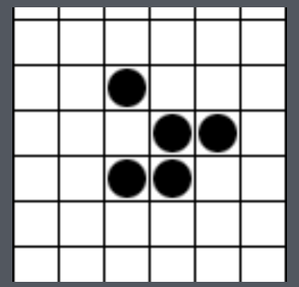


Interesting Patterns





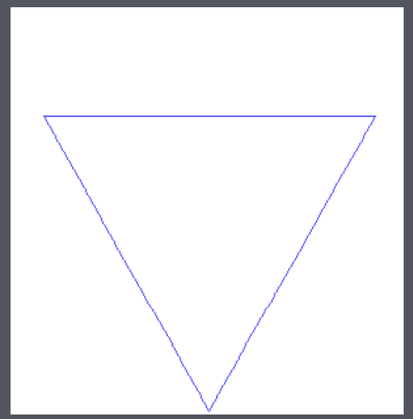
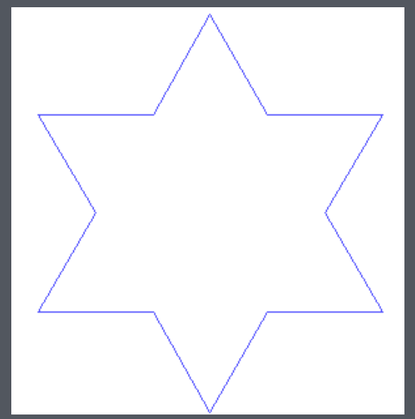
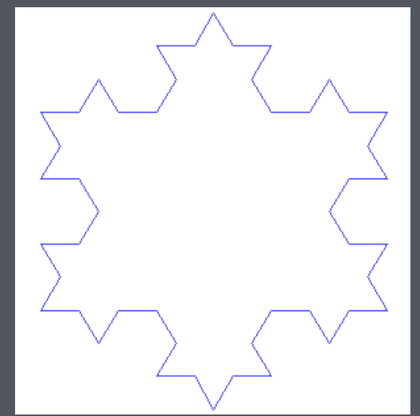
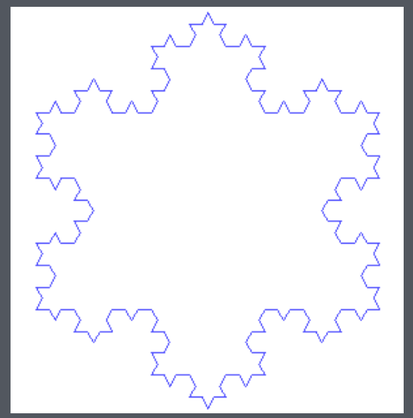
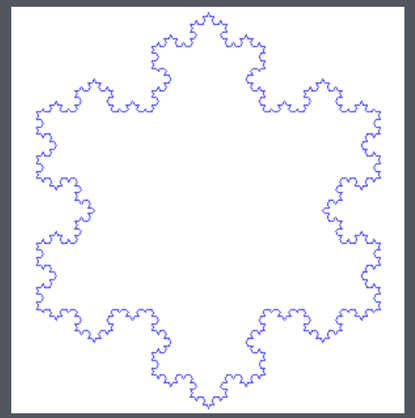
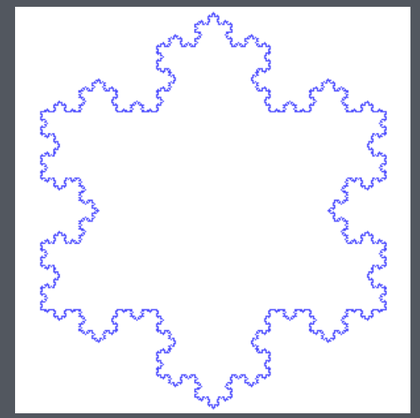




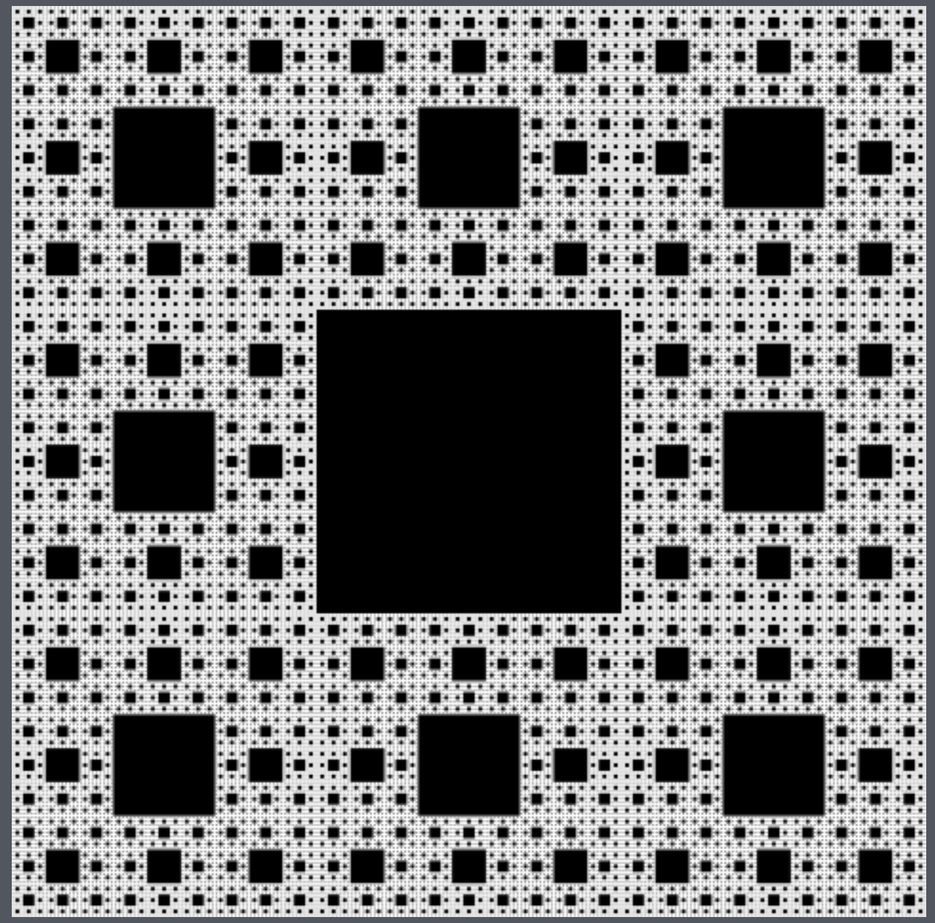
More Patterns on
https://en.wikipedia.org/wiki/Conways_Game_of_Life

4. Fractals

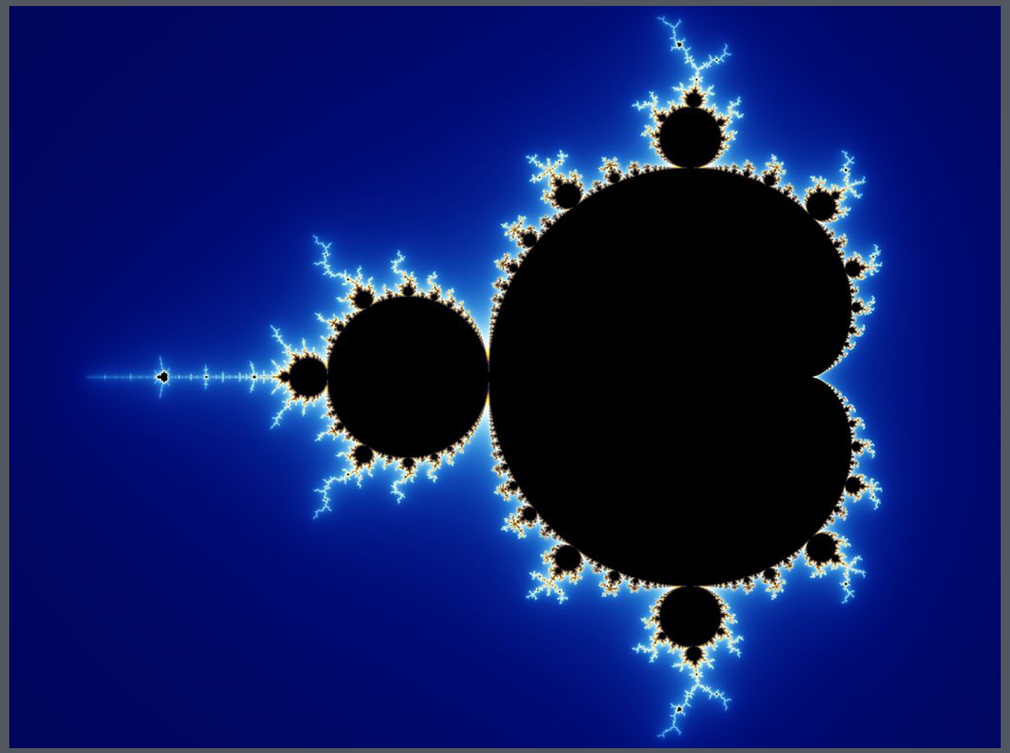
Koch Curve

Sierpinski Carpet



Mandelbrot Set

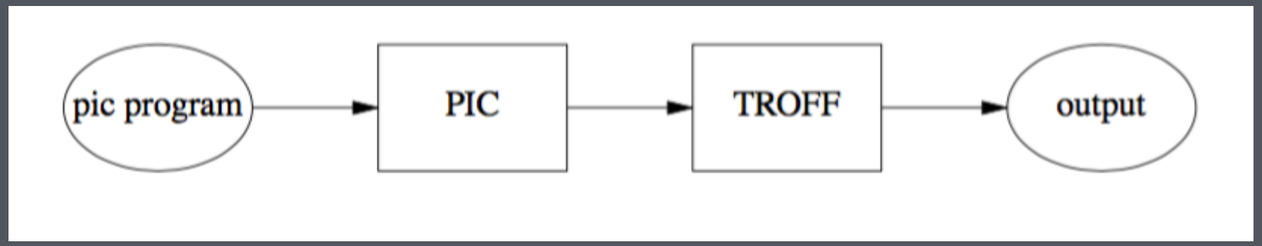


https://en.wikipedia.org/wiki/Mandelbrot_set

5. Little Languages[1]

[1] Programming Pearls - Jon Bentley, http://cs448h.stanford.edu/little-languages.pdf

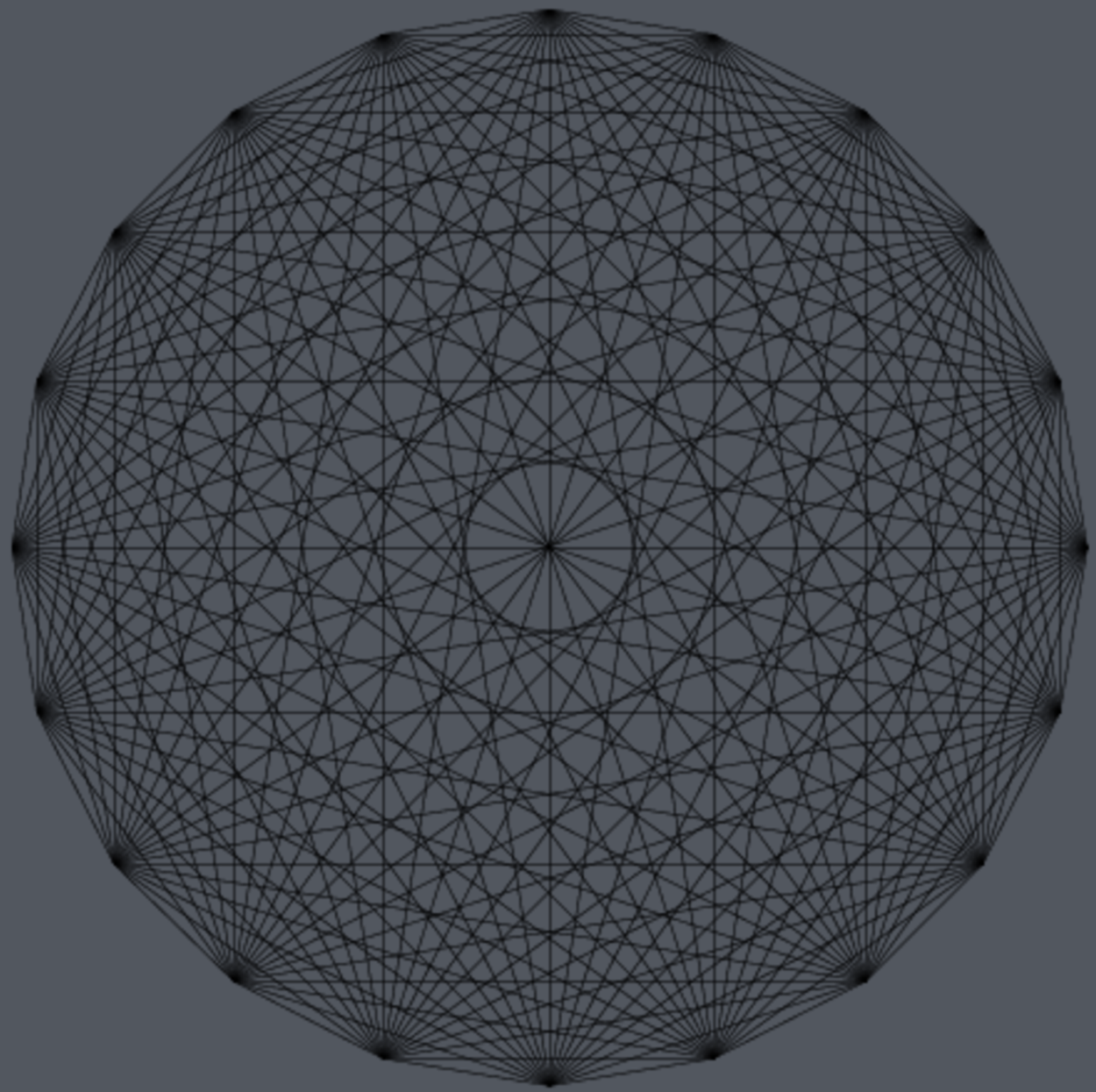
The Pic Language




```
.PS
ellipse "pic program"
arrow
box "PIC"
arrow
box "TROFF"
arrow
ellipse "output"
.PE
```

```
.PS
pi = 3.14159
n = 20
r = 3.5
s = 2*pi/n

for i = 1 to n-1 do {
    for j = i+1 to n do {
      line from r*cos(s*i), r*sin(s*i) \
           to   r*cos(s*j), r*sin(s*j)
    }
}
.PE
```



Regular Expressions

Little language for pattern matching.

Match numbers:

```
[0-9]+
```

Match HTML tags:

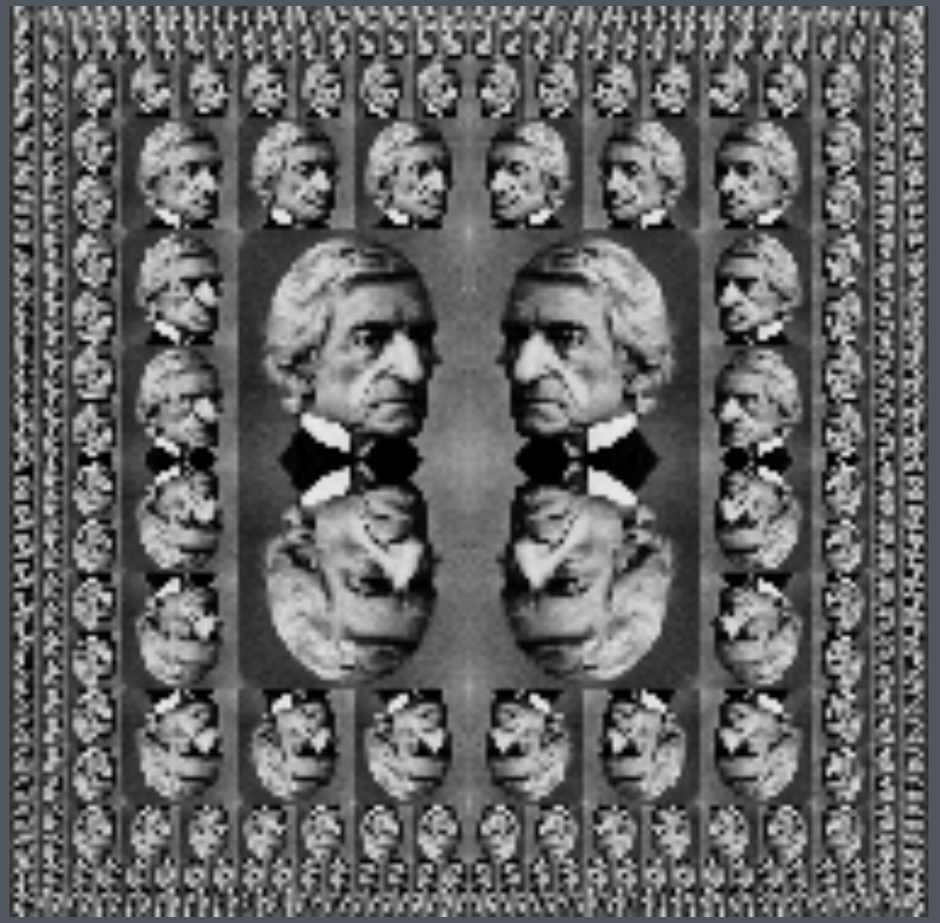
```
<[^<>]*>
```

Extract data from readable strings:

```
every day at 10:00 AM
every month on first day at 5:00PM
```

6. Functional Programming

Recursion is Amazing!



Example: Count Change

How to make change of 100 using denominations 50, 25, 10, 5 and 1?

Too tedious to try it manually. How about writing a program?

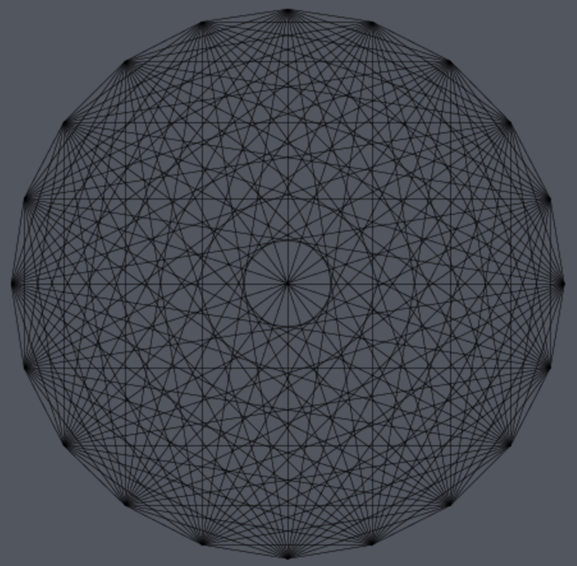
Structure and Interpretation of Computer Programs[2]

[2] https://mitpress.mit.edu/sicp/

A language that doesn't affect the way you think about programming, is not worth knowing.

— Alan Perlis

Happy Hacking!



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