Functional Programming

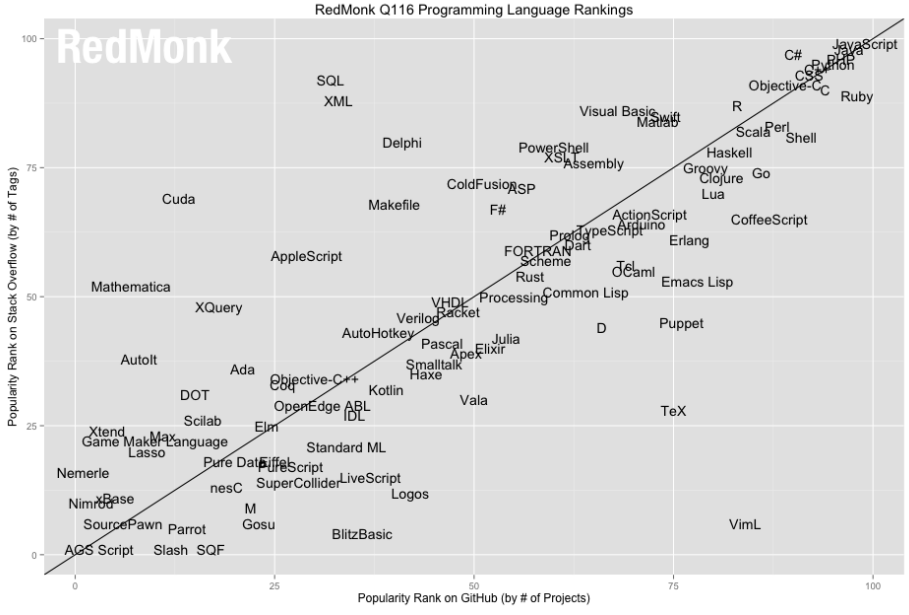
in Racket

Peter Campora

ULL

August 25, 2019

Programming Language Hot Takes



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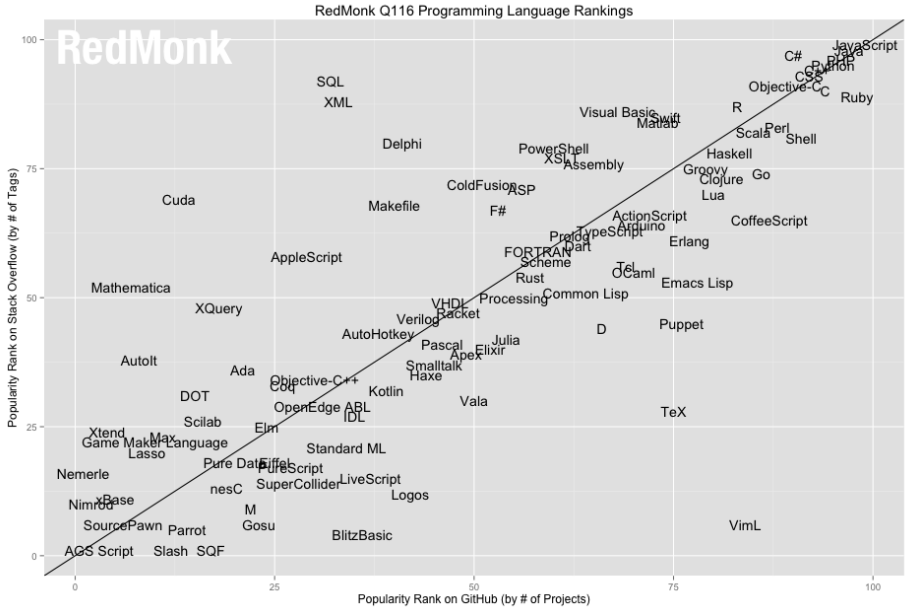

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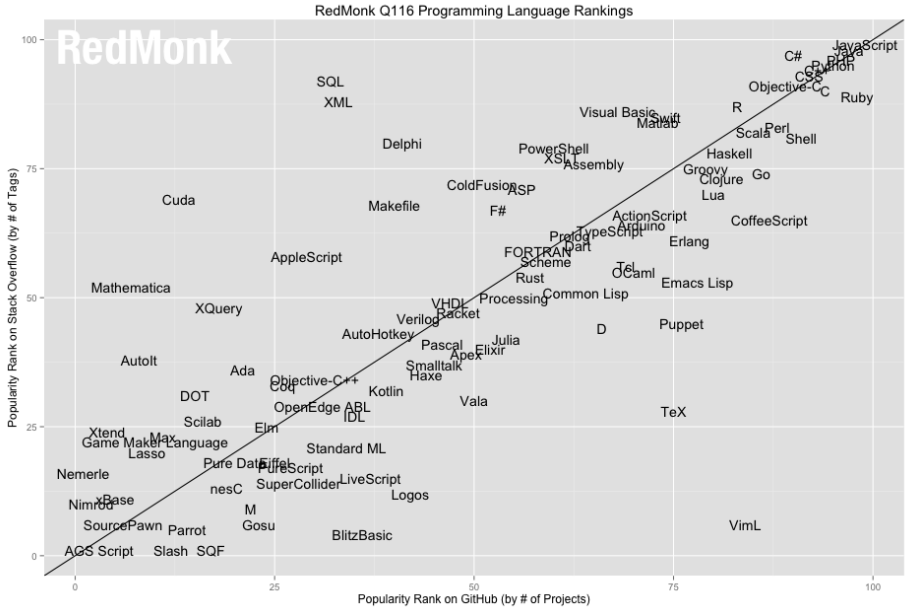

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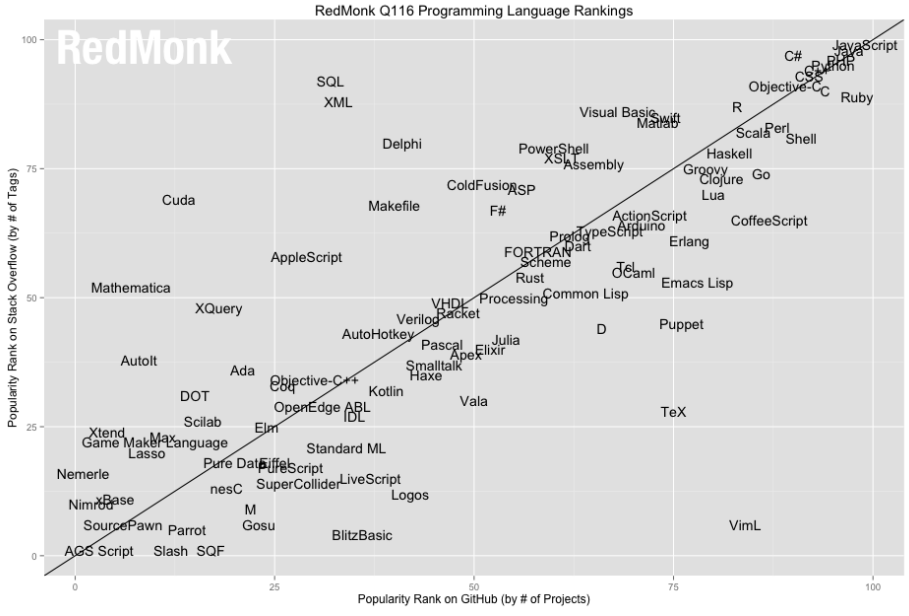

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And why is *functional programming* becoming such a buzzword?

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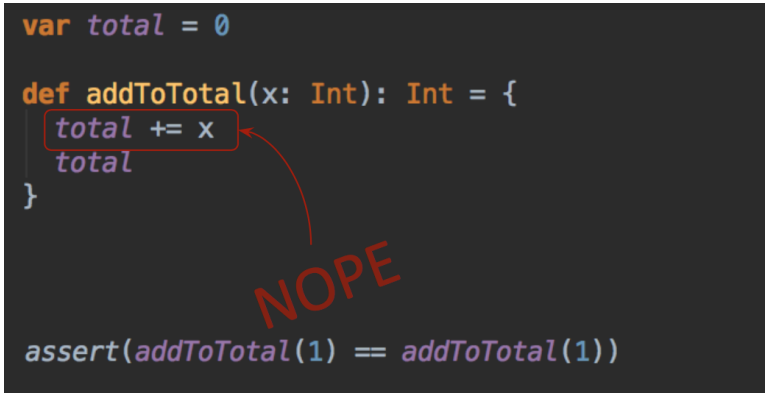

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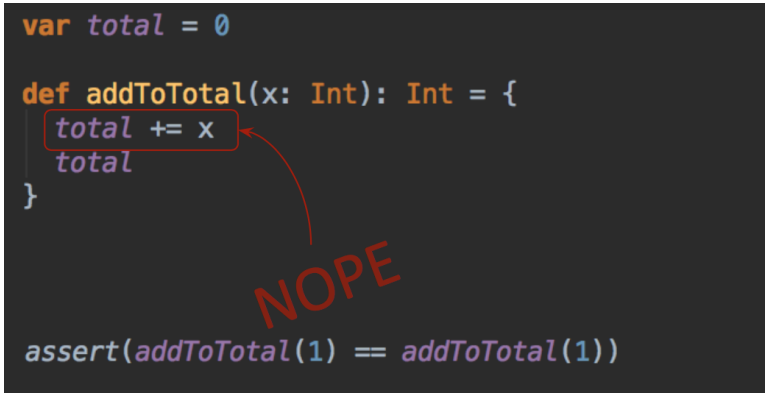

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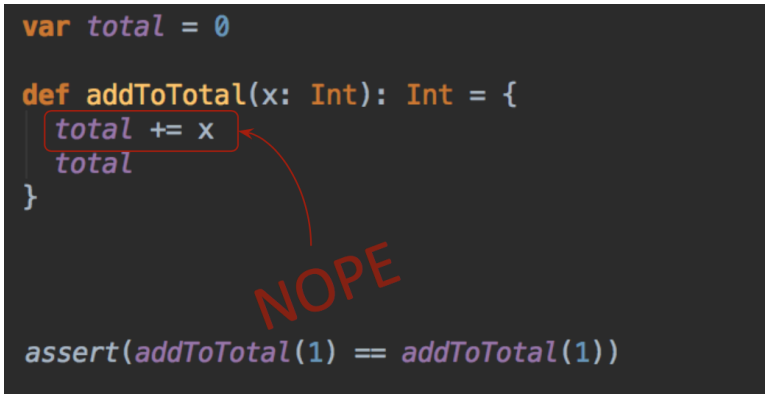

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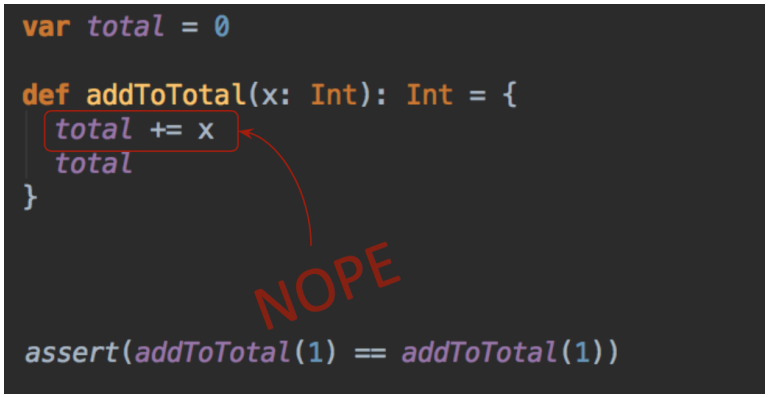

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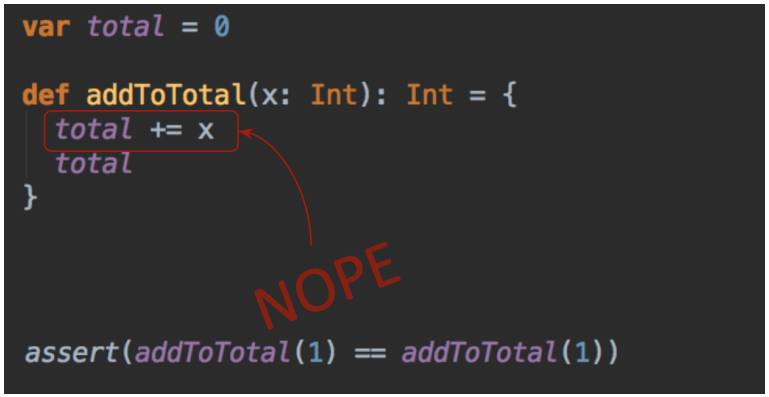

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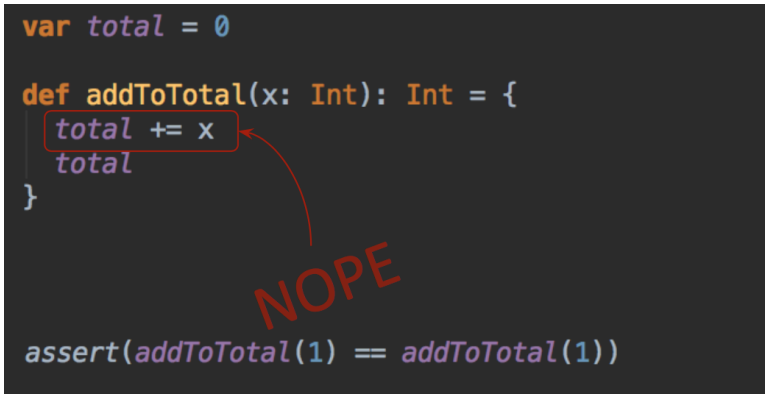

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- Concurrent programming is made difficult since order of evaluation matters.
- Functional idioms creep into imperative languages. Lambda and streams were added to Java, and JavaScript code becomes increasingly functional.

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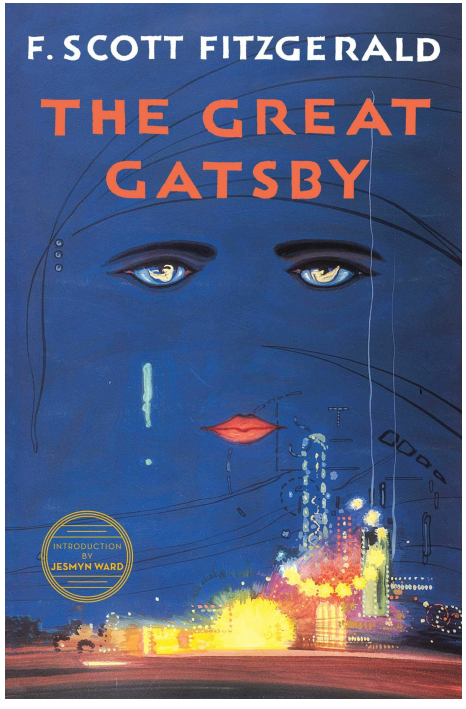

Can Code be Beautiful?

Write a program for summing the squares of numbers from 1 to n.

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```
public class SumSquares
{
   public static void main(final int[] nums)
   {
      int sum = 0;
      for (int i : nums)
        sum += i * i;
      System.out.println("The sum of the squares is:
↪   " + sum);
    }
}
```

An Equivalent Program

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Don't worry about the meaning and syntax of the program, yet. Given time, the parens will become beautiful!

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  - Critique: Disconnected from the empirical or mathematical viewpoints we typically employ to measure the value of scientific contributions.

Looks Like We Don't Know

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- Computer science continues on even though many of the first major results were about undecidability.

How Do We Write Programs?

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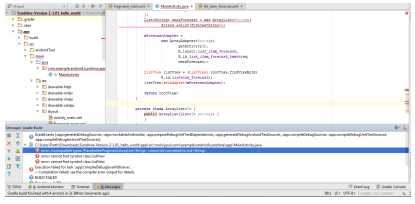

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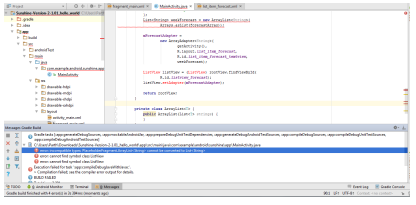

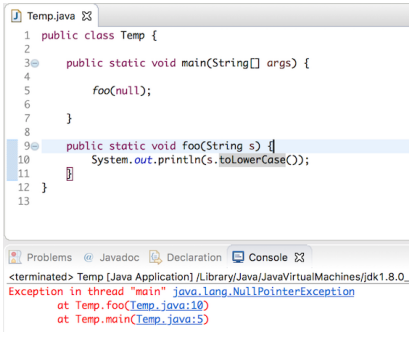

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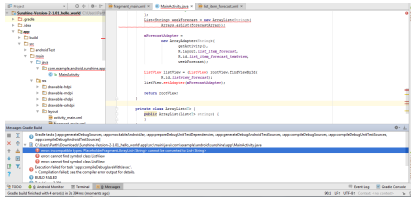

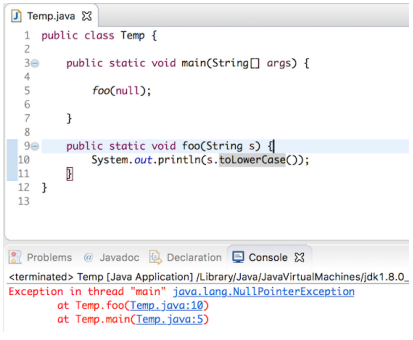

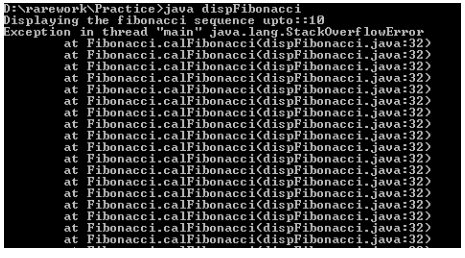

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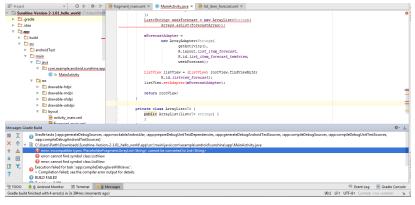

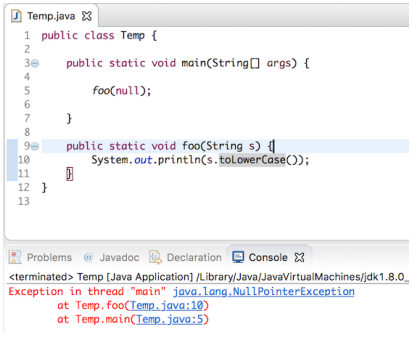

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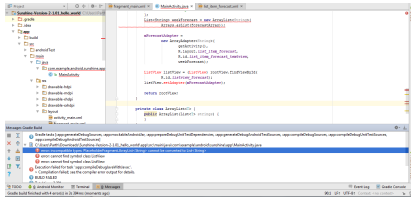

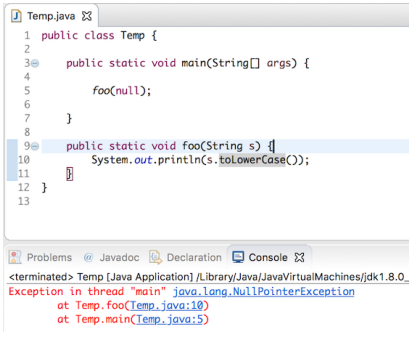

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- From there, programming becomes gluing together recognized patterns.
- **There has to be a better way!**

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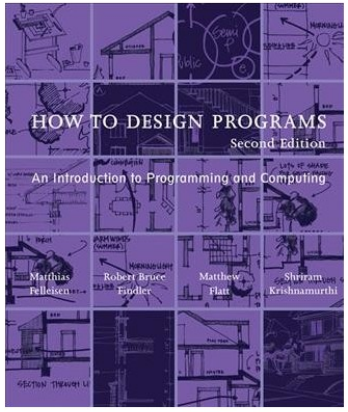

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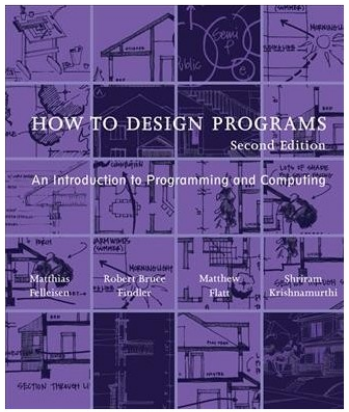

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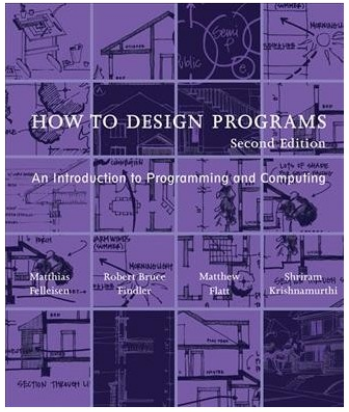

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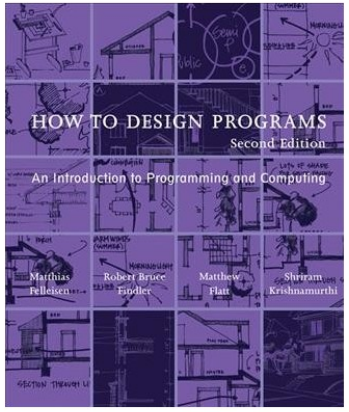

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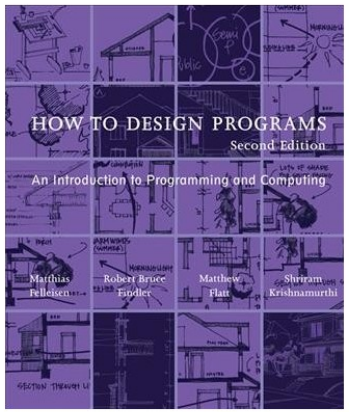

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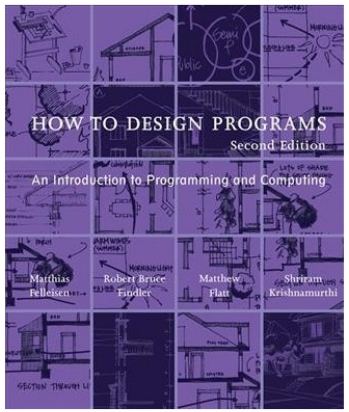

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- It presents recipes for designing two different types of programs.
  - Big bang (event driven) programs
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- Isn't this a course on functional programming?

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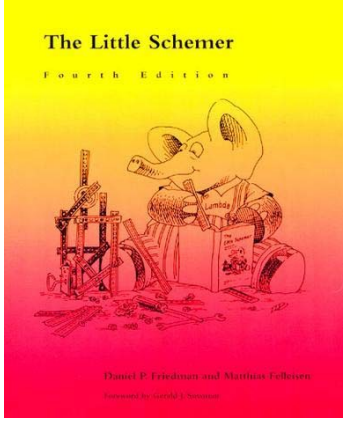
- 

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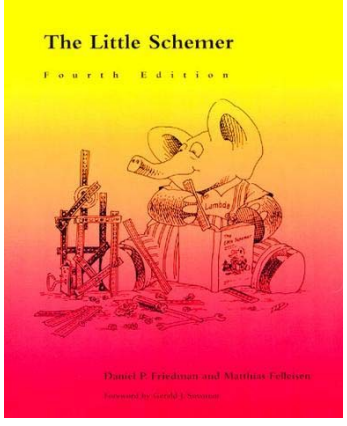
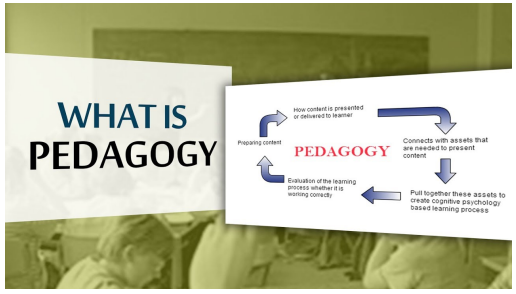
- 

- We will learn functional programming and systematic design, together!

Why Racket and Not X?



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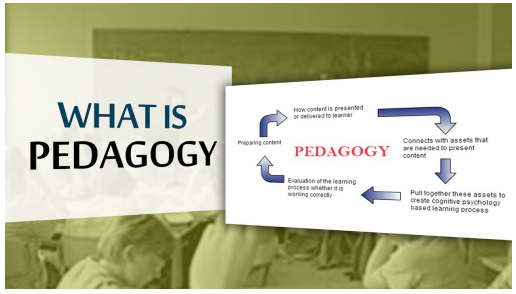

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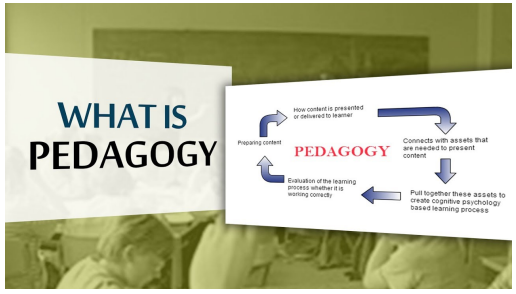

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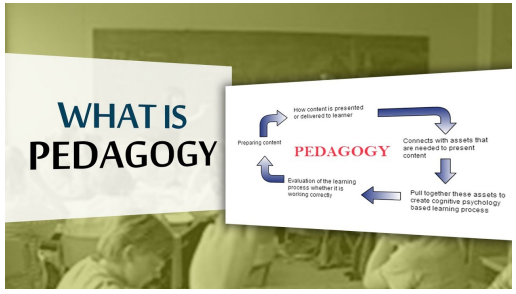

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- It's focused on being a good language for education

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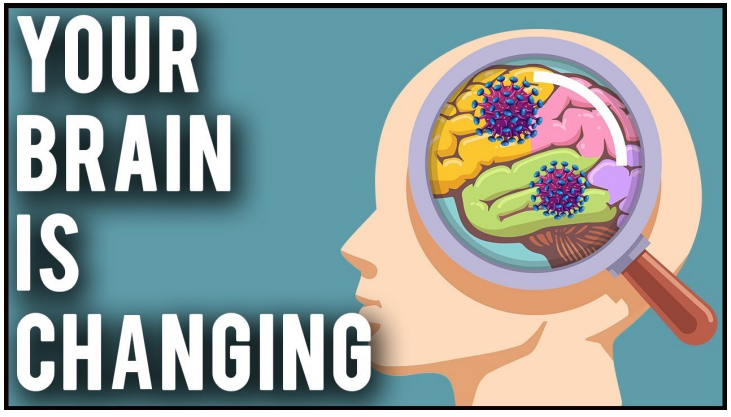
- I don't want to use this:

Moss

A System for Detecting Software Similarity

The Main Things I Want



What do you want?