Introduction

CS 350

Dr. Joseph Eremondi

Last updated: June 18, 2024

Course Overview

Course Objectives

To learn:

- Functional programming

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    - Recursion

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  - Parsing/Abstract Syntax

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- To change how you *think* about programming

Textbook

- *Programming Languages: Application and Interpretation*, 2nd edition, by Shriram Krishnamurthi

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    - Similar content but very different approach

Course Communication

- Everything on URCourses

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  - Assignments and Handin

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Grading Scheme

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- 25% midterm

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    - Thursday, July 25

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Assignments

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- Doing the assignments is the best way to study

Motivation: Functional Programming

Programming in This Class

- In plait

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- We’ll learn more why this distinction is fuzzy

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Will I Ever Use Racket in Industry?

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No

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No

(probably)

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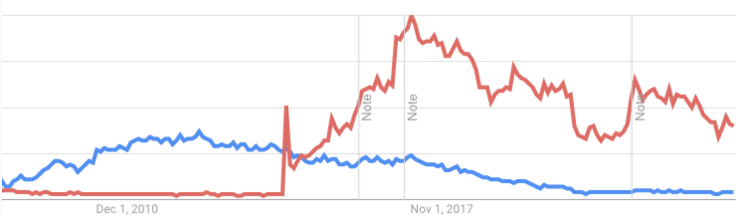
    - Racket is effective for learning how languages work

Language Trends (from Google Trends)

Objective C vs Swift



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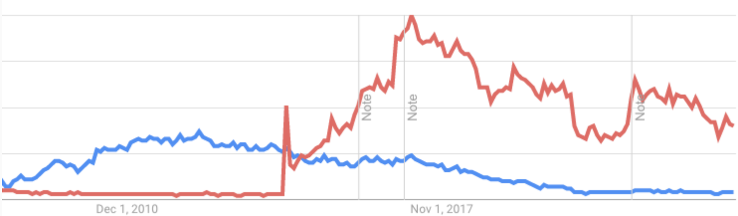
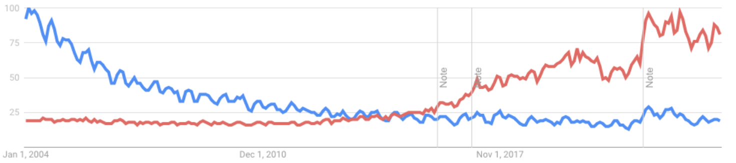


C++ vs Python



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    (* x (pow x (- y 1)))))
```

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    - Now in Python, Typescript, C++ (`std::variant`), Java (sealed interfaces), Rust (enums)
- Learning these features in Racket will help if/when they show up in other languages in the future

Motivation: Interpreters

Importance of Programming Languages

- Interpreter: Code + input $\hookrightarrow$ Output + effects

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    - Python, JavaScript, JVM all use some kind of interpreter
    - The CPU is just an interpreter for machine code

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    - Why is it slow/fast
    - How to prevent/properly handle errors
    - How to know that it's doing what you think it does

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Why interpreters are hard

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- By the end if this course, you will be able to write a program that is powerful enough to simulate every other computer program that ever has or ever will be written

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- It’s just a bunch of tree traversals