CS 420 Advanced Programming Languages
Fall Semester, 2022
Doc 1 Introduction
Aug 23, 2022

Course Issues

http://www.eli.sdsu.edu/courses/index.html

Waitlist
Course Web Site
Prerequisites
Grading
Books

Waitlist - How to get into a Class

Add yourself to the course waitlist

Instructors can not

- Add individuals to the class
- See who is on the waitlist
- Change your priority on the waitlist

Sep 2

Last day for regular students to add/drop classes

Last day to file for graduation

Office Hours

Tuesday & Thursday 10:30 am - Noon

Zoom: 914 283 418

Grading

1 exam

About 5 assignments

Final Exam

Course Website Demo

http://www.eli.sdsu.edu/courses/fall22/cs420/index.html

Prerequisites

CS 210 or CS 310 or CS 496 Data Structures

Books

Concepts of Programming Languages 12th Edition

The Rust Programming Language, https://doc.rust-lang.org/book/

Clojure for the Brave and True, Daniel Higginbotham No Starch Press, 2015, Available online through the library

Prolog Chapter 16 of Concepts of Programming Languages

C TBD

What is this Course About

Learning parts and variations in programming languages

Experiencing different programming paradigms

Understanding how languages work

Purpose of the course

Make it easier for you to learn new languages

Lots of Material

Learning about languages

- Concepts of Programming Languages - 1,000 pages

Learning Languages

- Rust
- Clojure
- Prolog
- C

Learning a New Language

Syntax

```
crt←{m|ω+.×α(⊣×⊢|∘⊃{0=ω:1 0 ⋄ (ω∇ω|α)+.×0 1,⍪1,-⌊α÷ω})⍨⍨α÷⍨m←×/α}
```

Semantics

```
applyTwice :: (a -> a) -> a -> a
applyTwice f x = f (f x)
```

Libraries

Tools, Culture, Ways of Solving problems

Classifying Languages

Paradigms
- Procedural
- Object-Oriented
- Functional
- Data-Oriented
- Logical

Static vs Dynamic Typing

Memory Management

Interactive vs "Compiled"

Why Rust

New hot language

Fast & Safe

Replacement for C, C++

New ways of dealing with memory management & concurrency

Why Clojure

Functional lisp variant

Immutable data

Code is data

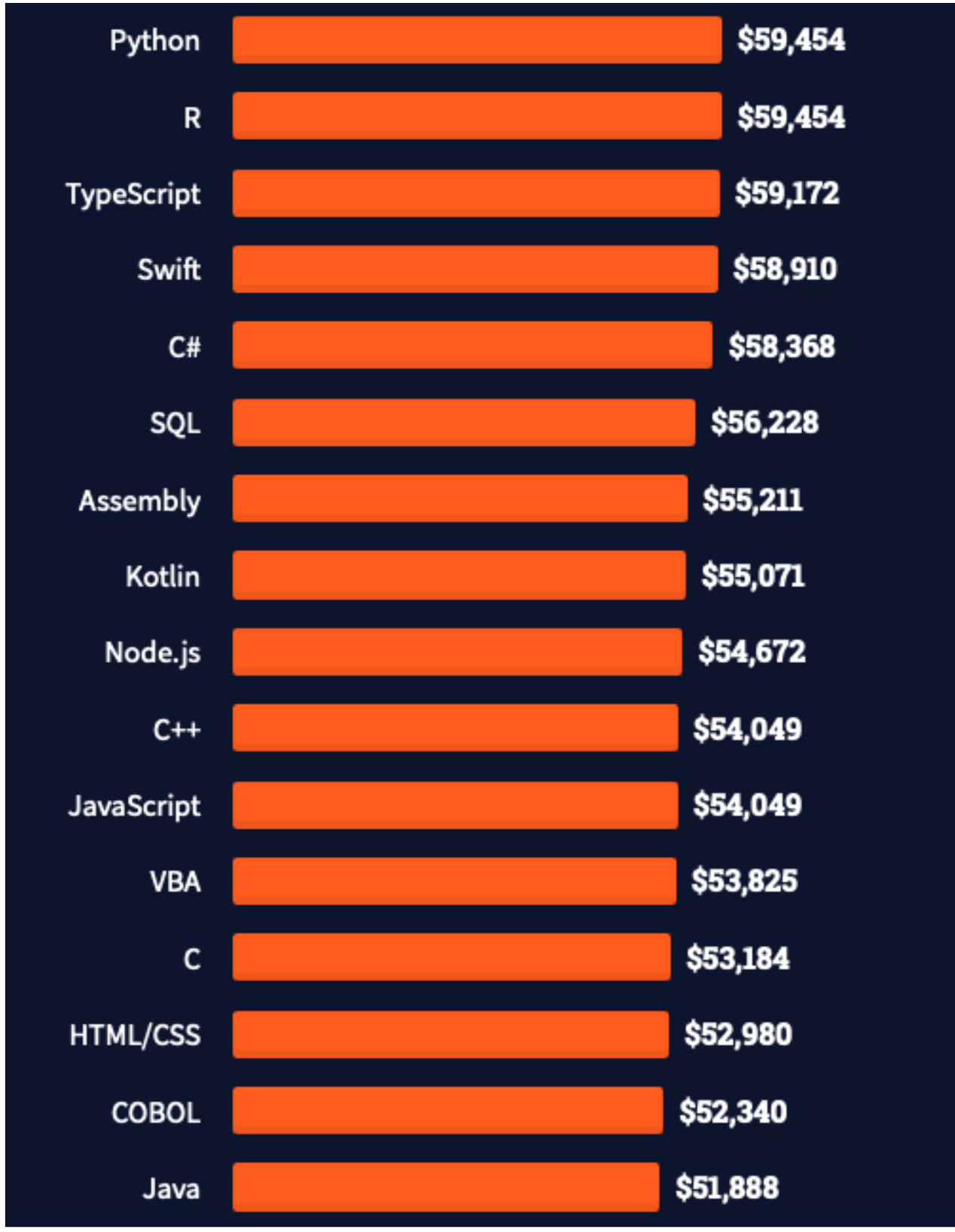
Data-Oriented Programming

Why Prolog

Logic Programing

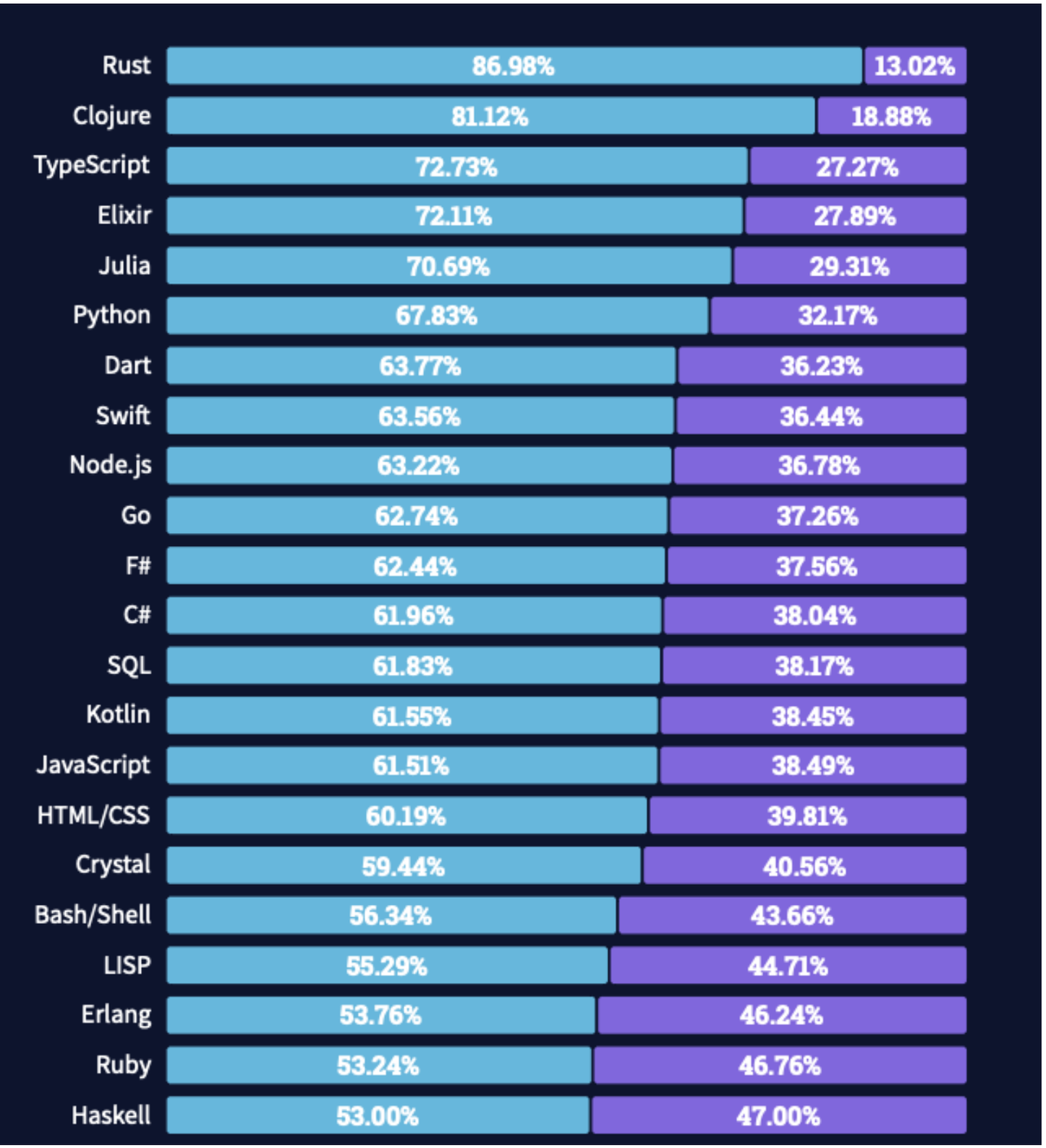
Why C

Pointers



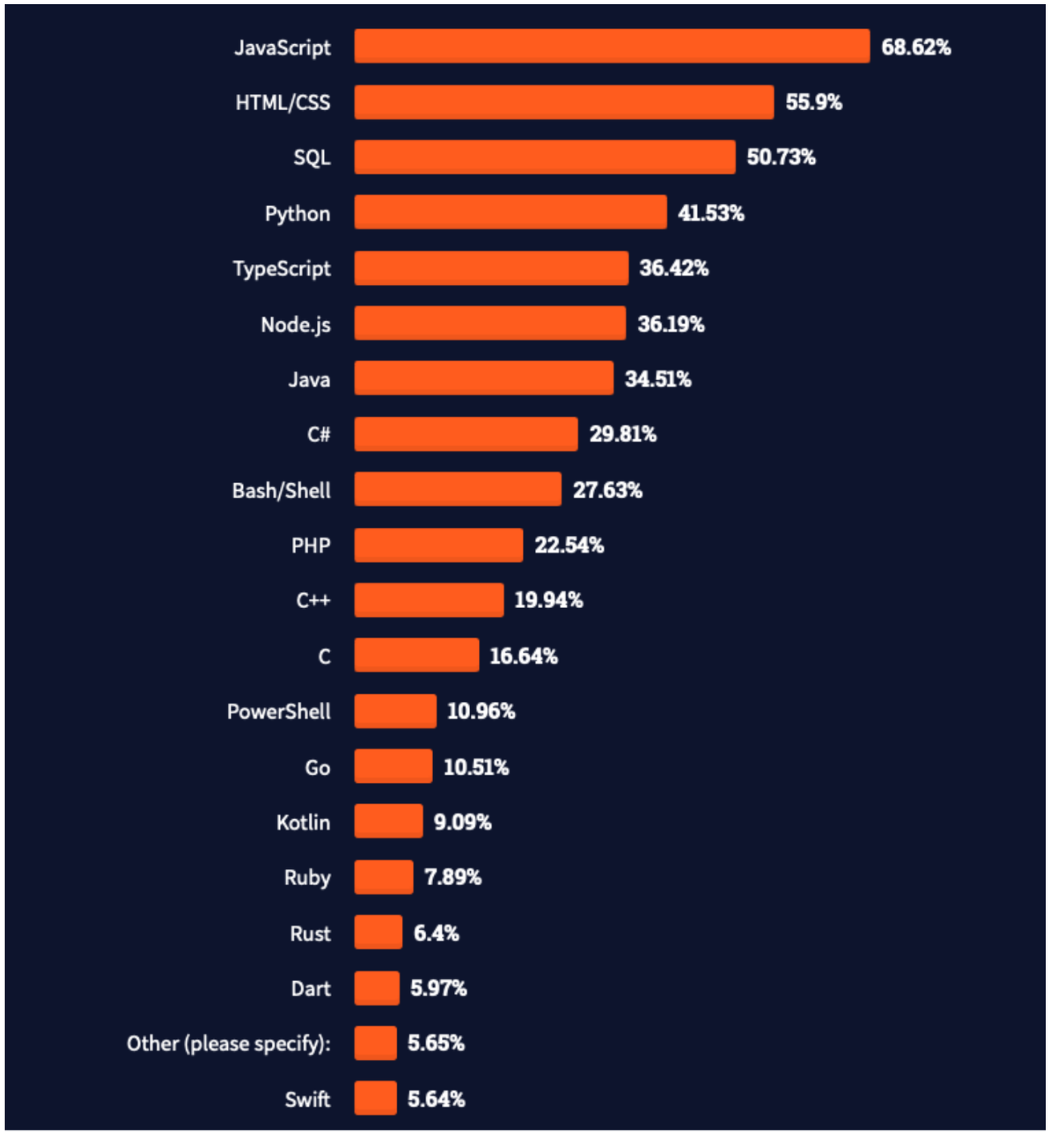
https://insights.stackoverflow.com/survey/2021#top-paying-technologies-programming-scripting-and-markup-languages

Loved VS Dreaded



https://insights.stackoverflow.com/survey/2021#most-loved-dreaded-and-wanted-language-love-dread

What They use Professionally



https://insights.stackoverflow.com/survey/2021#section-most-popular-technologies-programming-scripting-and-markup-languages

TIOBE Index for August 2022

Python	15.42%
C	14.59%
Java	12.40%
C++	10.17%
C#	5.59%
Visual Basic	4.99%
JavaScript	2.33%
Assembly language	2.17%
SQL	1.70%
PHP	1.39%
Swift	1.27%
Classic Visual Basic	1.27%
Delphi/Object Pascal	1.22%
Objective-C	1.22%
Go	0.98%
R	0.92%
MATLAB	0.90%
Ruby	0.82%
Fortran	0.81%
Perl	0.72%

https://www.tiobe.com/tiobe-index/