Programming Lanaugages (0)
Roadmap

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Objectives of programming languages

- easy to learn
- easy to get programs right
- execute fast
- safe (avoid disaster)

The course objectives

- get how different programming languages approach these goals differently
- topics
  - types
  - code reusability (generics, subtyping, inheritance, etc.)
  - memory management/safety
  - performance
  - building compilers
- the main course work: you choose a language from below and do course work in it
  - Go
  - Julia
  - OCaml
  - Rust

The course format

- after a few weeks, we group students
- each group will be four students, each working on a different language
- we discuss approaches to the above objectives taken by different languages, within and across groups
- you are expected to engage these discussions and other activities (not just to listen to talks and get things done)

Evaluation

- small coding-centric assignments (a few times)
- reflective essay (every week, until the end of the day)
- participations (esp. in discussions)
- a final report (building a simple C compiler)
- no exams

Reflective essay

- every week, you write a short reflective essay that expresses such things as
  - what *you* have learned (conceptualize/internalize experiences)
  - what came through *your* mind while listening to the talk and working on assignments
  - how *you* worked on the exercise (where you struggled, how you got help, how useful was ChatGPT, etc.)

Today

- answer a survey on your programming language experiences
- play with the Jupyter environment
  - choose a language you work on (for today)
  - write a few programs in it
- look at pl00_intro and work on assignment pl01_basics
- and share your answer!

About AI Chat (e.g., ChatGPT)

- generally OK to use it for coding exercises and technical assignments
- do not use it for reflective essays (obvious. it's about *you*)
- ChatGPT solves many basic coding problems esp. in early weeks
- basic coding problems are still given for
  - fun,
  - learning main *ideas* behind language design, and
  - prerequisite for discussing implementation (memory management, compilers, etc.)
- main takeaway: *you don't have to be struggled by minor/syntactic errors (ChatGPT will fix your mistake); you instead focus on ideas/concepts*

A special week on AlphaCode

- I welcome a volunteer(s) to make a deep dive into the AlphaCode paper (or others related to it)
- *"Competition-level code generation with AlphaCode"*
- You can do the presentation on this (or a related) paper and substitute a final report with it
- also look at an essay *"The Premature Obituary of Programming*