Outline

- Course objectives
- The course

Credits:
This presentation uses material from
https://courseware.stanford.edu/pg/courses/lectures/96023
Where the rubber hits the road

The code
(uses one or more Programming Languages)

Architect

Programmer

Tester

Compilers, Runtime environments

Diagnostic Tools
Programming Languages

- Universe of design ideas
  - Some get baked into languages, others are in libraries and idioms
- Language design concepts often pop out into systems design concepts
  - E.g. Map-Reduce, stateless — REST, ...
Programming Languages History

- Most concepts were invented in the 40s through 70s
  - A few in the 80s, even less in the 90s
  - Lots of detail work, combinations and optimizations
- People keep reinventing things, when the context is right
- “Know the past to understand the present”
Objectives of the course

- Understand concepts in PLs
  - 100’s of PLs, all *look* different ➔ they aren’t that different
  - Appreciate history, diversity of ideas
  - Be prepared for new languages
  - See beyond hype & sales pitches

- Learn some important facts about existing language systems and techniques
- Learn and think critically about design tradeoffs
Where this course stands

We will cover how PLs influence program design and vice-versa

Not covered: implementation of PLs. Recommended:
• CS 241 Advanced Compiler Construction
• EECS 221 Program Analysis
The Course

- Historical Languages
- Basics of PLs
- Function composition
- Objects and object interactions
- Reflection and metaprogramming
- Adversity: dealing with the outside world
- Data-centric concepts
- Concurrency
- Interactivity
Assignments and Grading

See course’s web page
Homework projects

- Weekly
- Will be posted as we go
- Collections of small programming exercises
Due Dates & Grading

- Weekly projects and summaries due on Saturdays
- Peer grading!
  - No submission week N => no peer grading week N+1

- Penalties:
  - 1% for every hour late for first 24 hours
  - 25% from then until next Saturday
  - No credit after 1 week