CS201 - Programming Languages

An Introduction

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Allegheny College

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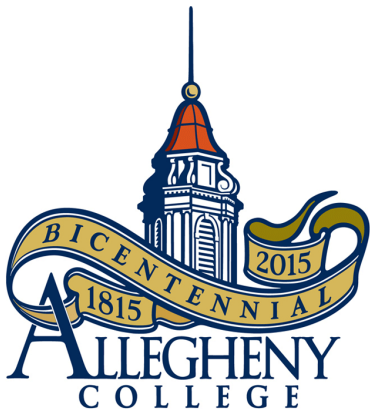


Meeting Time

- Lecture Session:
  - Monday, Wednesday, and Friday
    10:20 AM - 11:10 AM, Alden 101
- Lab Session:
  - Monday 3:00 PM - 4:50 PM, Alden 101

Professor's Office Hours

- Monday, Wednesday, and Friday:

  11:30 AM - 12:30 PM
- Tuesday, Thursday:

  11:00 AM - 12:30 PM

To schedule a meeting with me during my office hours, please visit my web site [teaching page] and click on the **Schedule** link in the top right-hand corner to schedule.

Website Details

- Professor's Website:

  `https://www.cs.allegheny.edu/sites/amohan/`

- Course Website:

  `https://www.cs.allegheny.edu/sites/amohan/course.php?cid=MTE=`

Textbooks

- Required Text: Programming Language Pragmatics, Third Edition by Michael L. Scott. Morgan- Kauffmann, 2009.

List of Tools

- GitHub - for accessing labs and lab submissions
- Docker - for completing the labs on your laptops

To Do

- Join Slack - link accessible through course webpage. [third button on the right hand side]

Things to do before next class (1)

Please read the course syllabus: Accessible through the course website. [button on the left hand side]

Things to do before next class (2)

- Get GitHub setup completed on your laptops:
- If you have not setup GitHub on your laptop previously, **no worries** watch the YouTube videos below and follow up with the Professor if you are facing issues with the setup!
  - `https://tinyurl.com/5hkfxef3`
  - `https://tinyurl.com/m84x3vrp`

Things to do before next class (2)

- Accept the class repository link by clicking on the GitHub icon in the course repository. [second button on the right hand side]

Things to do before Friday Lab (3)

- Get Docker setup completed on your laptops:
- Docker Mac Setup:
  `https://docs.docker.com/docker-for-mac/install/`
- Docker Ubuntu Setup
  `https://www.digitalocean.com/community/tutorials/how-to-install-and-use-docker-on-ubuntu-18-04`
- Docker Windows Setup:
  `https://docs.docker.com/docker-for-windows/install/`

  Feel free to follow up with the Professor if you are facing issues with the setup!

Things to do before first Lab on Monday (3)

- If the setup goes correctly as desired, you should be able to get started and run the hello world docker container using the following command:

  docker run hello-world

- There are some more documentation for Docker get started to test your installation in the link provided below:

  `https://docs.docker.com/docker-for-mac/`
  `https://docs.docker.com/docker-for-windows/`

My expectations from YOU

1. Attending both lecture and lab sessions regularly (see attendance policy in course syllabus)
2. Interact and engage with the materials discussed by asking questions, doing the in-class activities, and doing group discussions as appropriate.
3. Bring a notebook and start making notes

My expectations from YOU

4. Come to Office hours with questions that needs clarification
5. Complete the reading assignments provided at the end of each topic
6. Accepting the fact that we are learning some core CS concepts in this course and enjoy the process of learning computer science

About CS201: What this course is not about?

- Learning to program in [insert language here]
  - but this course should make it easier to learn new languages
- Learning tiny bits about lots of different languages
  - but we will use examples from many languages to examine more general principles
- “Religious wars” (“Which is better, Java or C++?”)
  - but you will learn about criteria that can be used to compare different languages

About CS201: What this course is about?

- How are languages designed and implemented?
  - Specifying syntax and semantics, compiled vs. interpreted, etc.
- How do such choices affect ease of use, efficiency, scalability, and other criteria?
  - Example: How should recursive calls be implemented? How does “garbage collection” work?
- What are the different programming paradigms?
  - Example: Why would anyone ever use a language like Prolog or ML rather than C++ or Java?

What is a programming language?

- A programming language is a set of rules that provides a way of telling a computer what operations to perform.
- More formally: **A programming language is a notational system for describing computation in a machine-readable and human-readable form.**

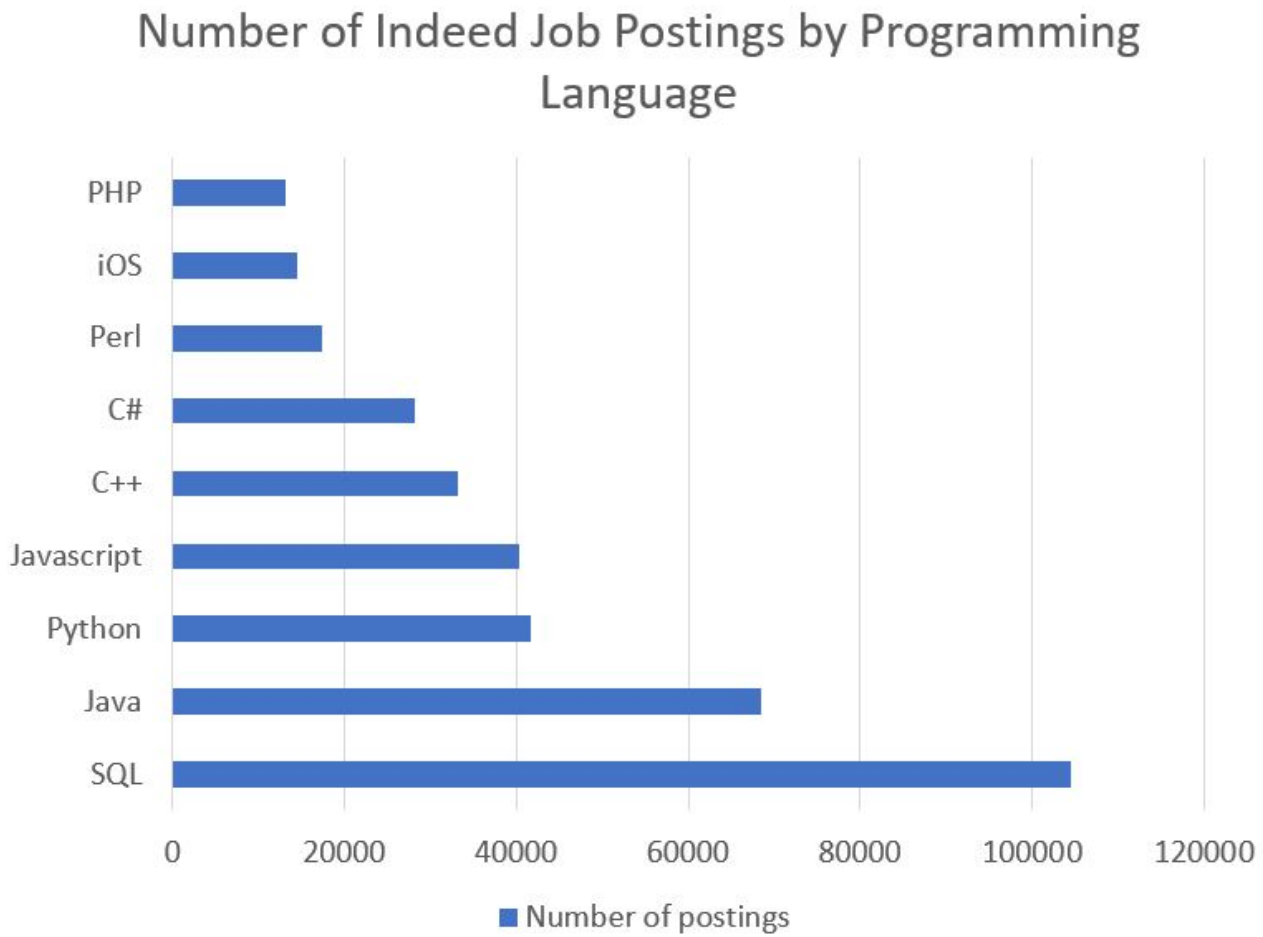
What is a programming language (contd)?

- Notion of Syntax and Semantics in a PL.
- Notion of Compiler Vs Interpreter in a PL
- **Program Levels:** High level program, Low level program, and Executable machine code.

Programming languages - a representative sample

Java Byte Code, HTML and Javascript,
Scheme/Racket, PostScript, Haskell,
Java, C++, C#, Python,
LISP, Bash, Amazon AWS EC2 Cloud,
Prolog, C, Fortran,
Maybe more ...

Programming Jobs - Some stats



- from codingdojo.com

Things to Discuss

1. Form groups of three.
2. Brainstorm some interesting problems in CS that you had come across and come up with a programming solution using your favorite programming language?

   One such interesting problem that I had come across is printing a series of asterisks using a pyramid pattern. Wait, we can do this iteratively or recursively?

   Join Slack - link accessible through course webpage!

   Post your first Slack message in the @class-activity channel with your design document and code output. It is acceptable to upload either typed down code (runnable) or an image of your hand-written code to get the class participation credit. One posting is sufficient for a team – Add team members names.

Reminder

- **Lab 1:** on Monday, Aug 30th.

Reading Assignment

- **PLP:** Chapter/Section - 1.1

Questions?

Please ask if there are any Questions!