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Welcome!

Syllabus Review

- Learning Objectives
- Academic Integrity
- Course Structure
  - Labs
  - Homeworks
  - Exams
  - Final Project

Fill out Info Sheet

By the end of this course, you will be experts at Git, Linux, and Java.

Java

- Brief history of Java. . .
  - Most used programming languages (IEEE, 2024): https://spectrum.ieee.org/top-programming-languages-2024
  - Github, 2022: https://octoverse.github.com/2022/top-programming-languages
- Value semantics:

```java
int x = 5;
int y = x;
y = 17; // what is x? (it's still 5)
```

- Reference semantics:

```java
int[] a1 = {4, 15, 8};
int[] a2 = a1;
a2[0] = 7; // what is the first element of a1? (it's 7 !!)
```

- Why reference semantics?
  - Efficiency
  - Memory Usage
  - Copying objects
- What to watch out for:
  - modifying objects in functions in other classes
  - assuming pass-by-reference for primitive types

27 September

Go over "quiz" problem

```java
class MyInt {
    public int value;
    public int increment()
    {
        value = value + 1;
        return value;
    }
}

public class MyClass
{
    public static void main(String[] args)
    {
        MyInt x;
        MyInt y;
        x = new MyInt();
        x.value = 13;
        y = x.increment();
        System.out.println(x.value);
    }
}
```

CS Culture

Graph structures

- centralized: cult, classroom
- decentralized: equal, possible weak links
- blobs

Misc comments

Incentives affect culture: industry vs startup vs research vs hobby

Imposter syndrome, dunning-kruger

Advices: join clubs, develop hobbies, follow your gut, take history classes

Linux and Git!

- Linus Torvalds
- Tour of the linux filesystem:
    - everything is a file
    - root, users and groups
- Command line and shells
    - Bite size command line by Julia Evans
    - terminal config
- Makefiles
- Cloning a repository and pushing changes