CS 211: Introduction

Chris Kauffman

Week 1-1
Goals

- Motivate: Java and OO
- Problem Solving
- Course Mechanics
- Tools
Why Java / OO

Object-Oriented Design
- Method to decompose problems for solution (by computer programs)
- Style of programming / arranging code
- A way of thinking independent of any particular PL

Java
- Built around OO methodology
- Garbage collection
- Huge and useful standard library
- Tons of 3rd party libraries
- Widely deployable
- Huge corporate backers
- Fashionable methodology
- Will help get you a job
Java’s Place in the World

Pure Abstraction

- Python, JS
- Ruby, Shell
- C++, D
- C
- VHDL
- Bread Board
- Gates
- Wires
- Electrons
- Prolog, Lisp
- ML, Haskell
- Binary
- Opcodes
- Assembly

Bare Metal

- Closer to hardware than some contemporaries
- "Hardware" is a Virtual Machine that is reasonably close to actual machines
- Abstracts away memory management (woot!)
- Basic language mechanisms are still C-spirited
- Allows single dynamic dispatch

Img Source: http://bpmredux.wordpress.com/
Kauffman’s Philosophy

- You will not program in java your entire career
- Object-oriented programming...
  - Not well defined
  - Not widely understood
  - Has not made programs much better
  - May go out of style
- Problem solving will always be fashionable
- Good Program Design transcends time

Programming is

- Formalizing a solution method
- Translating into a mechanically executable form

Designing is

- Ensuring the solution can be implemented correctly
- Ensuring the solution can adapt to changes
Programmers Are Like Super Heroes

OO will be one tool in your growing utility belt. Make sure it’s not the only one.
Let’s Solve a Problem (or at least start)

- Each GTA is assigned some lab sections for CS211
- Each lab section has a day/time and a student count

Your program (pseudocode / python/ whatever)
1. Read the data file provided
2. Compute the Head Count for each GTA
3. Print the Discrepancy: difference between biggest and smallest head count

Input Data File

<table>
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<th>Time</th>
<th>Room</th>
<th>Count</th>
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Head Counts

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Discrepancy: 49
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**Head Counts**

- **Raj**: 55
- **Adam**: 60
- **Li**: 48
- **Le**: 48
- **Kacem**: 39

**Discrepancy**: 24
Variants

**Feasibility**

Determine if a GTA assignment is possible/impossible

▶ Is the following assignment possible?

```
201  R  12:30  4457  19  Li
202  R  01:30  4457  15  Raj
203  R  02:30  5358  6   Adam
204  R  03:30  4457  21  Raj
206  R  12:30  5358  22  Li
```

**Balance**

Determine the GTA assignment that is possible and has the lowest discrepancy
Course Mechanics

See the course mechanics slides
Upcoming

Lab this week

▶ Set up jdk 1.8
▶ Install DrJava if desired
▶ Compile a few basic programs
▶ Submit lab code by 5:00pm Sunday

Project 1 will be finalized in the next day or so
If weather affects some labs, we will make a Piazza Announcement
This Week/Weekend

- Make sure you set up your environment and can compile programs
- **READ** Reges/Stepp Ch 1-4
  - Overview of procedural programming in Java
  - Good review, entertaining writer
- Practice It Exercises associated with the chapters