Course Summary
Lecture 36
News

- Homework 3 is due today…
- Please do the end-of-term survey
  - http://www.surveyfeedback.ca/surveys/ wsb.dll/s/1g404
  - Worth on point (together w/ beginning-of-term survey)
- Final exam: Dec 11, 8:30 am, OSBO A
  - Length: 2:30
- Extra office hour: Wednesday, Dec 9
  - 11:00 – noon, ICICS/CS x639
Reading (Big Java, 3rd Ed.)

- Chapter 1.1 through 1.8 (introduction)
- Chapter 2.1 through 2.10 (using objects)
- Chapter 3.1 through 3.8 (implementing classes)
- Chapter 4 (data types)
- Chapter 5.1 through 5.4 (decisions)
- Chapter 6.1 through 6.5 (iteration)
- Chapter 7.1, 7.5, 7.6, 7.7 (arrays)
- Chapter 14.1, 14.3 (searching and sorting)
- Chapter 8.1 through 8.9 (designing classes)
- Chapter 9.1, 9.2, 9.3 (interfaces and polymorphism)
- Chapter 10 (inheritance)
Reading (Big Java, 2nd Ed.)

- Chapter 1.1 through 1.8 (introduction)
- Chapter 2.1 through 2.10 (using objects)
- Chapter 3.1 through 3.8 (implementing classes)
- Chapter 4 (data types)
- Chapter 6.1 through 6.4 (decisions)
- Chapter 7.1 through 7.5 (iteration)
- Chapter 8.1, 8.5, 8.6, 8.7 (arrays)
- Chapter 19.1, 19.3 (searching and sorting)
- Chapter 9.1 through 9.9 (designing classes)
- Chapter 11.1, 11.2, 11.3 (interfaces and polymorphism)
- Chapter 13 (inheritance)
Key Concepts

- The following is a list of some of the most important concepts you learned in this course.
  - Disclaimer: this list is incomplete – refer to book and lecture notes for the full detail.
Key Concepts

- Basics of Computation
  - Procedures, processes and programs
  - Algorithms
- Basic structure of computers
  - CPU, memory, fetch-decode-execute cycle…
Key Concepts

- Simple programs
  - Identifiers
  - Variables
    - Declarations
    - Assignments
- Primitive data types
- Arithmetic expressions, operator precedence
- Casting
Key Concepts

- Simple classes
  - Classes and objects
    - Constructors, methods, fields
    - Static fields and methods
    - Accessors vs. mutators
    - Scope of local variables, parameters, fields
    - Visibility modifiers (private, public, protected)
- String class
- Creating your own classes
- Reference vs. value types
Key Concepts

- Program Flow
  - Boolean expressions and operators
    - Short circuiting
  - Conditionals
    - (Nested) if
- Loops
  - While
  - Do … while
  - For
  - Break statement
Key Concepts

- Arrays
  - Array declaration, creation, initialization
  - Parallel arrays vs. arrays of objects
  - Looping over arrays
  - Multi-dimensional arrays

- Sorting and searching
Key Concepts

- Advanced class design
  - Interfaces
    - Implementing one or more interfaces
    - Defining your own interfaces
  - Inheritance
    - Extending classes
    - Shadowing of methods
    - Calling shadowed methods, super class constructors
    - Abstract classes
- Differences of interfaces and inheritance
Key Concepts

- The Big Picture™
  - Thinking in terms of processes/procedures
  - Program design
    - Encapsulation
  - Code re-use and sharing / polymorphism
- Program development process
  - Errors / Debugging
Where does this leave us?

- In this course, you have learned how to design and implement basic programs in one language (Java)
  - A lot of the things you learned here apply equally to other programming languages
  - Other languages have their own distinct advantages and disadvantages – in practice, people choose the right tool for the job.
  - As you get more experienced, picking up other programming languages becomes really easy
Where does this leave us?

- The Java features you know now are sufficient to write even the most complex programs, but:
  - Sophisticated algorithms, data structures may be required!
  - There are additional techniques that aid in developing and maintaining really big programs

- Practice, practice, practice…!
Practice, Practice, Practice

- Get involved in actual projects…!
  - Start your own hobby projects
    - Write a small game
    - Program a Lego robot
    - …
  - Enroll in the co-op program
    - Get real-world programming experience while working with industry
  - Get involved in research projects
    - Volunteer to work in one of our research groups (after 2nd year)
What Now?

- **CPSC 121 Models of Computation**
  - A first look at the theoretical foundations of computing along with some basic hardware. Includes discrete mathematics, sets, relations, functions, logic, circuits, and simple theoretical models of computing.

- **CPSC 211 Intro to Software Development**
  - You'll build on what you've learned here to tackle larger, more complex problems and wrestle with the software design issues that accompany those problems.