

Introduction to CSE 1020

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Website

www.cse.yorku.ca/course/1020/

Syllabus

- Required Textbook
 - Java By Abstraction: A Client-View Approach, 2nd Ed. by H. Roumani. ISBN: 0536503494; Publisher: Pearson Ed., 2008.
- Evaluation
 - eChecks: 10%
 - Assignment One: 5%
 - Labtest #1: 15%
 - Midterm Exam: 20%
 - Labtest #2: 15%
 - Final Exam: 35%

Questions?

Goals of 1020

- Programming fundamentals
- Object-oriented concepts
- Problem solving

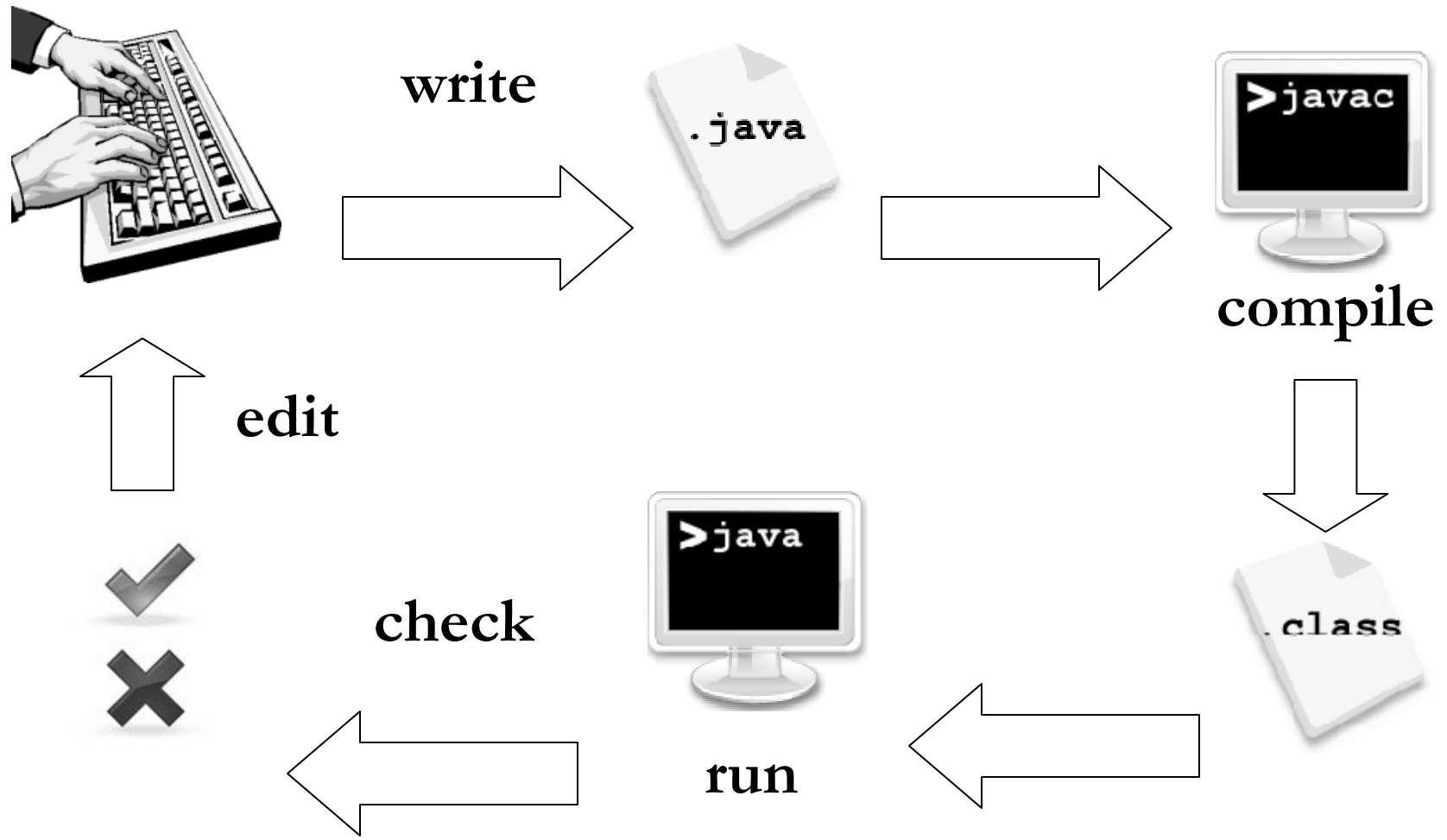
Why Program?

- Computers can
 - Perform billions of mathematical and logical operations every second
 - Operate continuously without error
 - Allow communications over vast distances
 - Facilitate the sharing of ideas, information, and knowledge

Why Program?

- But, computers are... dumb!
- Computers can only accomplish what their program tells them to do
- Programmers help make computers the valuable resource that they are

How to Program



How to Program

- Write code in a computer language (remember to save the file)
- Use the language's compiler to convert your code to machine-readable code
- Run your program
- Compare actual result to expected one
- Edit your code as necessary, and repeat

Machine Language

- Why not just program in machine language?
- Machine languages are
 - Machine-dependant
 - Complex and verbose
 - Difficult to understand large programs
- Compilers abstract (i.e., remove) the complexities of machine language
- Programming languages simplify design

Object-Oriented Programming

- Object-oriented languages (e.g., Java) encapsulate (i.e., represent) real-world concepts as “objects”
- Objects (and methods to operate on them) are defined in entities called “classes”
- Java includes a library of predefined classes defined in an Application Programming Interface (API)

Abstraction Levels

- Abstraction allows a programmer to focus on a single responsibility
- Focus is either “high-level” or “low-level”
 - High-level: simple, general (e.g., `print(5 + 3)`)
 - Low-level: complex, specific (e.g., store the integer value 5 in memory register \$1, store the integer value 3 in memory register \$2, add the values in \$1 and \$2 and place their sum in \$3, print the contents of \$3 to the screen)

Design Methodologies

- Top-down (high-level to low-level)
 - Start with general requirements
 - Divide into specific responsibilities
 - Implement components for each
- Bottom-up (low-level to high-level)
 - Identify the primitive operations required
 - Implement modules to perform such tasks
 - Facilitate collaboration between the modules to meet the required specifications

Focus of Chapter One and Two

- Chapter One
 - Low-level
 - Java syntax
 - Data types and ranges
- Chapter Two
 - High-level
 - Abstraction
 - Client-Implementer delegation

Questions?