

CMPT 101/104

Introduction & Computing History

May 5, 2003

Course Goals

- ④ Lower-level understanding of "how a computer works"
- ④ Fundamentals of procedural programming languages and structures
- ④ Fundamentals of Object-Oriented Programming (OOP)
- ④ Introduction to Java

The Texts

- ☉ Java - An Introduction to Computer Science & Programming 2nd Edition, Walter Savitch
- ☉ Java spec at <http://java.sun.com>
- ☉ Anything that is an "Intro to Java" could be useful. Don't waste money, use Google.

The Staff

- ☉ Dylan Tisdall

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- ☉ ASB 9911 MW 11:30 - 1:00

- ☉ TAs

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Computing Resources

- ④ 'Assignment Lab' AQ 3144
- ④ Any semi-modern machine will do
 - ④ Windows, Linux users can download latest Java Development Kit (JDK) from <http://java.sun.com>
 - ④ Mac OS X users are setup by default
 - ④ `java -version` to check the version of JDK installed; ≥ 1.3 is needed

Grading

- ④ 5 Assignments (40%)
 - ④ 4%, 8%, 8%, 8%, 12%
 - ④ Written and electronic part to each
- ④ 1 Midterm (20%)
- ④ 1 Final (40%)
- ④ Must pass weighted average of exams

Questions about the
course?

Card-Driven Automata

- ④ Joseph-Marie Jacquard (1752-1834)
 - ④ Cards specified the pattern to weave
 - ④ 1801 - exhibited his invention in Paris
 - ④ 1812 - 11,000 of his looms were in use in France

- ④ Charles Babbage (1791-1871)
 - ④ Difference Engine (1821 - 1833)
 - ④ Analytical Engine (1833-1842)
 - ④ Difference Engine No. 2 (1847-1849)

Lady Ada Lovelace (1815-1852)

- ④ Funded Babbage's Analytical Engine development
- ④ First person other than Babbage to write programs for the Analytical Engine

Herman Hollerith (1860-1929)

- ④ Used one punched card per person to perform sums for the US Census Bureau
- ④ Founded the Tabulating Machine Company to market the machine. The name was later changed to IBM.

Digital & Theoretical Computers

Alan Turing (1912-1954)

- ④ Developed theory of Universal Turing Machine
- ④ Helped crack Enigma

ENIAC

- ⦿ First large digital computer (operational 1946)
- ⦿ Turing complete
- ⦿ Designed to compute ballistics tables

John von Neumann (1903-1957)

- ☉ Worked on the Manhattan Project, quantum mechanics, economic game theory
- ☉ Developed modern computer architecture

von Neumann Architecture

- ☉ Instructions stored in memory with data
- ☉ A "program counter" keeps track of where in memory to load instructions from
- ☉ General and (with enough instructions and memory) Turing complete
- ☉ Basis for all modern digital computers

Java

Why Java?

- ④ Designed for embedded devices
 - ④ Must work on many different machines
 - ④ Must not crash easily
 - ④ Must be simple for developers

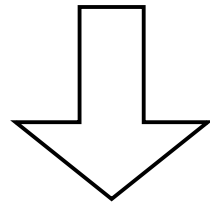
Why Not C++?

- ☉ Compiles to be platform-dependent
- ☉ Object-oriented behavior "hacked" onto C
- ☉ C++ can be dangerous, even with experience

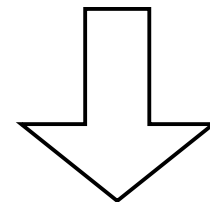
C++/Java Compared

C++ Code

Java Code



Compiler



Executable

Executable

Virtual Machine

Hardware

Hardware

Before Next Class

- ☉ Savitch
 - ☉ pp 1-13
 - ☉ "Algorithms" through "History of Java" on pp 21-26
- ☉ Try out the machines in the lab