Course Objectives

In CS100, students will acquire the following skills:

- Use computer and Internet technology (web, USENET, CIT resources).
- Develop and implement algorithms from verbal/written problems.
- Develop programming skills to produce working code/software (design, test, debug, document, demonstrate).
- Apply programming languages (MATLAB, Java).
- Build and use expressions with variables, operators, and other language elements.
- Implement control structures (conditions, loops).
- Use functions/methods to replace redundancy and improve modularity.
- Use and apply arrays for situations with collections of data (one dimensional, multidimensional).
- Know the meaning and applications of the fundamentals of object-oriented programming (encapsulation, inheritance, polymorphism).
- Search and sort information.
- Perform text processing with characters and strings.
- Perform user and file input and output for text.
- Plot numerical data.

The versions of CS100, M and J, achieve these objectives with different amounts of MATLAB and Java.

Problem vs Algorithm

Steps in Problem Solving

Algorithm: a set of procedures for solving a problem

Program: an algorithm written in some language

Variable: a named space or location for storing a value

Assignment: the action of putting a value into a named space (variable)

Problem:

Is a given integer even or odd?

More precisely...

An integer is written on a card. If the integer is even, say "even," otherwise say "odd."

AEW

	M	T	W	R	F
12:20–2:15					
2:30–4:25					
7:30–9:25					

Enrollment starts Thursday 9/6:

1. Select at least **two** times
2. Bring add/drop form to Student Success Center, **167 Olin**, to see Bianca Anderson
3. Dept approval given by B. Anderson
4. Get advisor signature
5. Take form to College registrar

Note: 1 S/U credit, 2 absences allowed after 9/21

Workshops begin week of 9/10. Attendance required after 9/21.

1 Agenda

- course objectives
- intro
- course mechanics
- problem solving and algorithm
- definitions
- AEW

2 Course Objectives

- serves as syllabus (also on web)
- note repetition ⇒ programming concepts

3 Introduction

background, programming experience, course experience, things that bother me...

4 Questions and Course Mechanics

- Calculus prerequisite
- newsgroup loosely monitored
- textbooks
- lecture handout

5 Problem vs Algorithm

Problem: task trying to accomplish
Algorithm: procedures for solving a problem

5.1 Steps in problem solving

- Understand situation
- Define objectives
- State assumption
- Gather data
- Build model
- Apply or solve model
- Assess results

More specific for programming:

- State problem clearly
- Define inputs & outputs
- Design algorithm
  - Decomposition
  - Stepwise refinement
- Convert algorithm to program
- Test resulting program

5.2 Algorithm

- even/odd example
- prompt for algorithm
- huge input
- refine algorithm
- is it really better, for whom?

6 Program

(60-32)*5/9

- what does it do?
- make it a legit, work for a bunch of temperatures?
- name a variable, store the result

7 Definitions

Variable, assignment