Welcome to CIS 122

What
Why
When, where, etc.

Questions
Which
How

What is programming?
Computational problem solving

Start with a task (for example, a calculation to perform, an idea to implement, a domain to explore, a problem to solve, etc.)...

apply a computational process
A computational process is a sequence of well-defined operations that leads from an initial starting point to a desired final outcome.

FOR EXAMPLE:
How many students are in class today?

1. everyone stand up
2. assign yourself the # 1
3. while the # of standing students is > 1 –
   a. partner with the person closest to you
   b. add your numbers
   c. one person is assigned the sum
   d. the other person sits down
4. report the total.

A sequence of well-defined operations is called an algorithm.
FOR EXAMPLE:
How many students are in class today?

COMPUTATIONAL PROBLEM SOLVING:
• desired ending point
• initial starting point
• description of how to move systematically from the input to the output/algorithm

ALGORITHMS

have been around for a long time
use an existing one
adapt (revise, refactor) an existing one
develop a new one
can be carried out (implemented) by a person or a machine

Other examples of algorithms?

TASK → Computational Thinking →
COMPUTATIONAL PROCESS/ALGORITHM →
DESIRED OUTCOME

Computational thinking is the thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information-processing agent. [CunySnyderWing10]
A computer program implements an algorithm on a computer.

**TASK/INPUT → Computational Thinking →**
**COMPUTATIONAL PROCESS/ALGORITHM →**
**COMPUTER PROGRAM →**
**DESIRED OUTCOME/OUTPUT**

**Coding** is a process that leads from an algorithm to an executable program.

**Designing, writing, documenting, testing, debugging**

**Why (should you learn to) program?**

(0) Gain fluency in computing which is ubiquitous in our lives today.

“Program or be programmed.”

-- Rushkoff
I think everyone should know how to program a computer, because it teaches you to think. I view computer science as a liberal art, something everyone should learn to do.”
-- Steve Jobs

Programming is a fun and useful intellectual exercise which develops or enhances valuable transferable computational thinking skills, including logical, creative, design skills.
-- Campbell, et. al.

Gain a tremendously powerful problem tool.

“Advances in computing have expanded our capacity to solve problems at a scale never before imagined, using strategies that have not been available to us before.”

The best signpost to the future I know is to follow whatever happens after the word ‘computational’ ... [when] one applies ... computers to traditional domains and sees what happens.”

Why (should you learn to) program?

Programming is a fundamental part of computer science for minors/majors/professionals, and provides exposure to many topics in the field of computer science.

CIS 122 counts toward UO B.S. math/computing requirement, UO science group requirement, and as a CIS 210 programming prerequisite.

Which CIS course is right for you?

105 Explorations in Computing
110 Fluency with Information Technology
111 Introduction to Web Programming
115 Multimedia Web Programming
122 Introduction to Programming & Problem Solving
210, 211, 212 Computer Science I, II, III
CIS 122 Introduction to Programming and Problem Solving Spring 2016

✓ What
✓ Why
✓ When, Where

Questions

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