# CS 105: Introduction to Computer Science

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Materials adapted from Dave Wonnacott

# Why do we have an exam?

- Process of synthesizing the material on your own is essential

- Preparing the “study sheet” is designed to facilitate that process

# Logistics: Midterm 1

- In class on **Thursday, March 6** (1h 20min)
- You may use one letter page (front and back) “study sheet”, handwritten, created by you
- Practice midterm on March 4

# Recap: Python Basics

We have seen many Python elements:

- *Function definitions*, including *parameters*
- *return* statements
- *input* and *print* statements (to communicate with the user)
- *variable* definitions
- conditional statements: *if*, *if-else*, *if-elif-else*
- loops: *while, for*
- *docstring* comments (to communicate with other programmers)

# Recap: Understanding Code and Computations

We sought to understand code by:

- *testing* it, e.g., with a test suite for circle_rectangle_overlap, etc.
- *stepping* through it, e.g., with PythonTutor or PyCharm
  - repeated stepping will, of course, go all the way to the final answer or output (or error)
- *refactoring* (occasionally), e.g., replace call with function body
  - repeated refactoring, combined with arithmetic, can also get us all the way to the final result
- *drawing/diagramming* it, as PythonTutor does
  - this gets more and more important as the data get complicated, especially if we *change* it

# Recap: Python Object Types

We saw many types of objects:

- boolean
- integer
- floating-point approximations of real numbers
- strings
- lists of objects of some usually-uniform type (first *mutable* object we've seen)
- tuples of objects of various types (immutable, fixed-size)
- dictionaries (mutable, variable-size)

# Python “range” function & assignment operators

```
# range(start, stop, step); default start is 0, default step is 1
for i in range(5):
    print(i)    # stop value not included


num += 1        # is the same as num = num + 1
val -= 2        # is the same as val = val - 2
```

# Loops practice