WRITING SIMPLE PROGRAMS

CSSE 120—Rose-Hulman Institute of Technology

Announcements

- Homework assigned on Wednesday each week:
  - Reading/Quiz part of first assignment due at start of next class
  - Programming parts always get at least 48 hours

Assigned on	Reading and Quiz Due (next class)	Programs due (at least 48 hours)
Monday	Wednesday	Wednesday
Wednesday	Thursday	Friday
Thursday	Monday	Monday

Show Off Some Cool Graphics

- Who would like me to show off their work?
- Otherwise I'll pick some programs at random

- What other kinds of programs would you like to write?

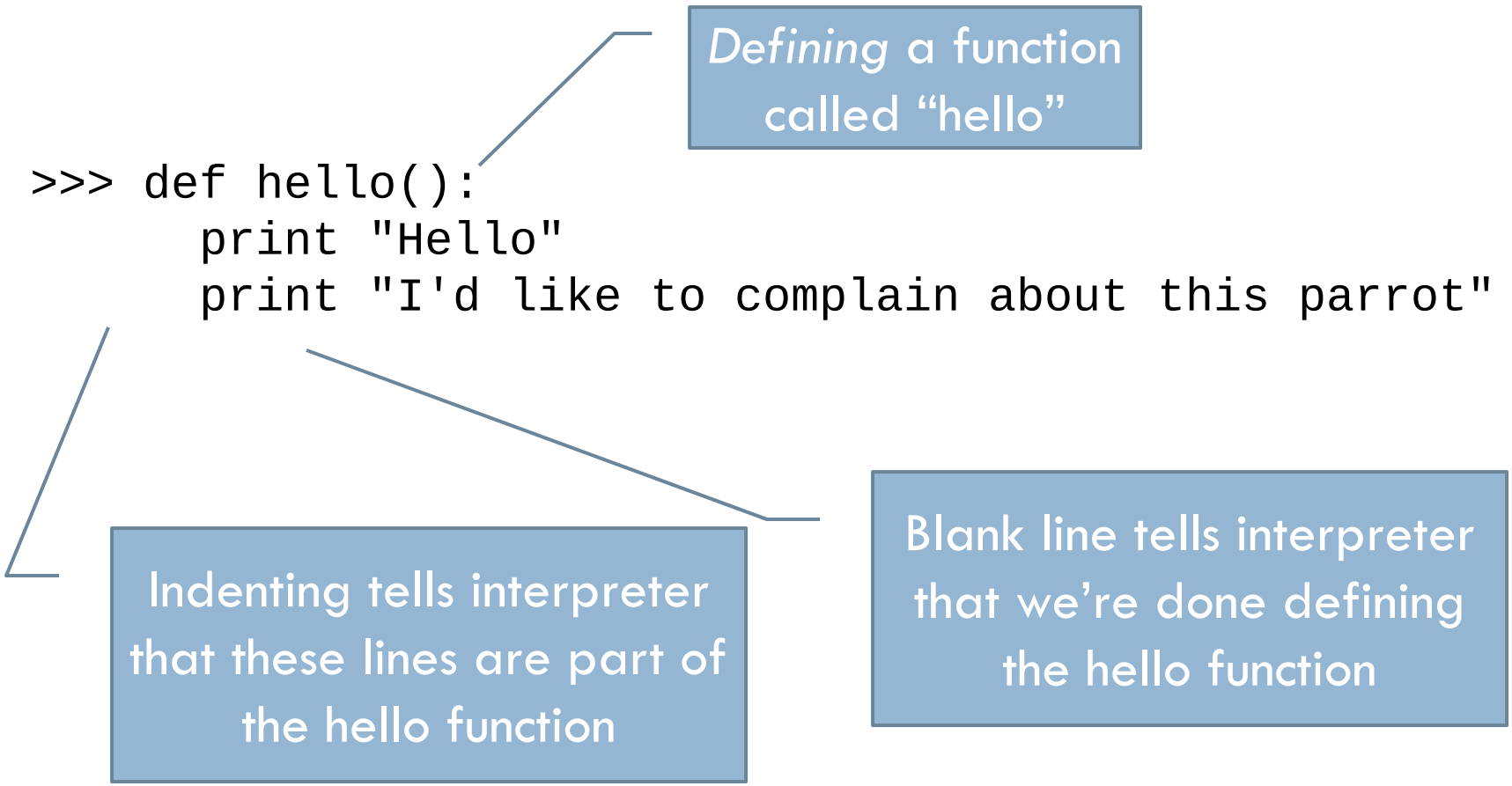
The Python Interpreter

- What it does:
  - Takes in Python commands
  - Converts them to 0s and 1s for the "CPU"
  - Gets answer back from "CPU"
- How we'll use it:
  - IDLE's Python *shell*—lets us "talk with" the interpreter
  - >>> is the Python *prompt*

Reviewing some concepts you read

- *Functions*
  - Named sequences of statements
  - Can *invoke* them—make them run
  - Can take *parameters*—changeable parts

Parts of a Function Definition



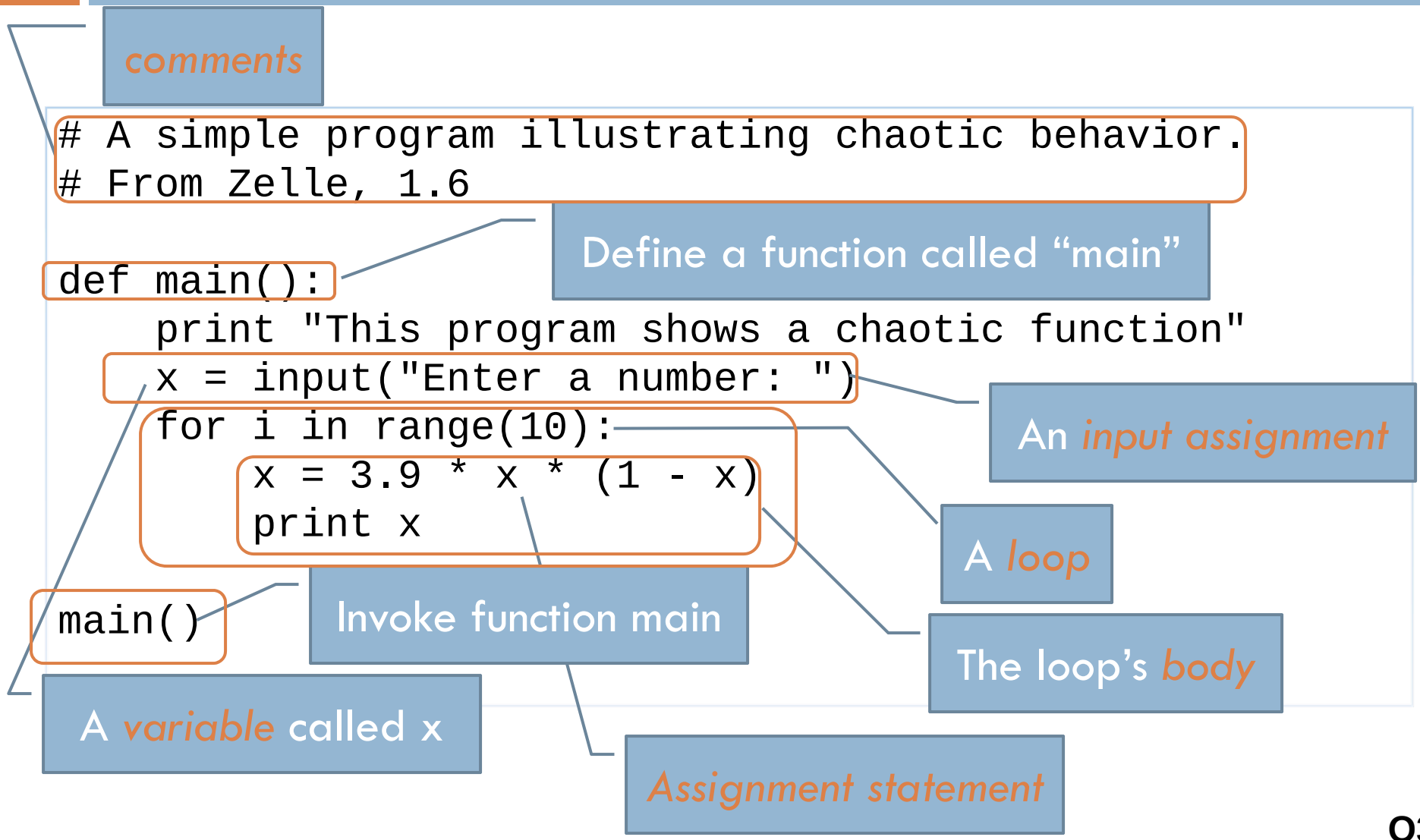
Defining vs. Invoking

- Defining a function says what the function should do
- Invoking (calling) a function makes that happen
  - Parentheses tell the interpreter to invoke the function

```
>>> hello()
Hello
I'd like to complain about this parrot
```

  - Later we'll define functions with parameters

A simple program that defines and invokes a function called main()



Q3

Saving Programs

- Annoying to keep retyping
- Can save definitions in separate files
  - Called *modules* or *scripts*
  - In IDLE, use File → New Window
- Can edit with any old text editor (like Notepad++)
- Can use an *integrated development environment(IDE)*
  - Recognizes what you type
  - Tries to help
  - Examples: IDLE, Eclipse

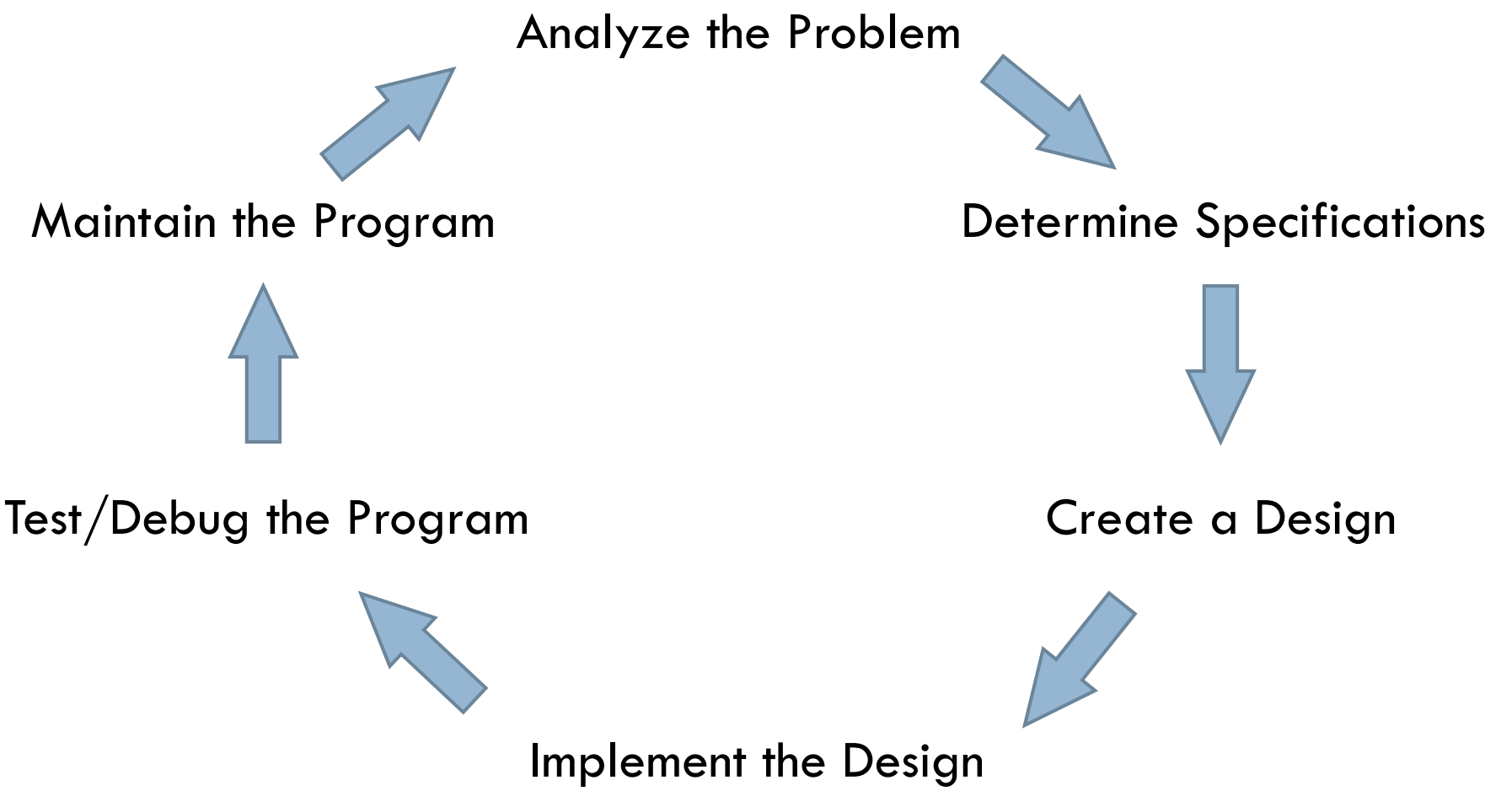
Running Programs

- Like typing in all the lines, but easier
- One way: Open file in IDLE and run it
  - File → Open…
  - Select the file
  - Run → Run Module
- Another way: type `import <module>` at prompt
  - Replace <module> with name of module
  - Don't type the ".py"
  - Example: `import chaos`

Your .pyc is in my directory!

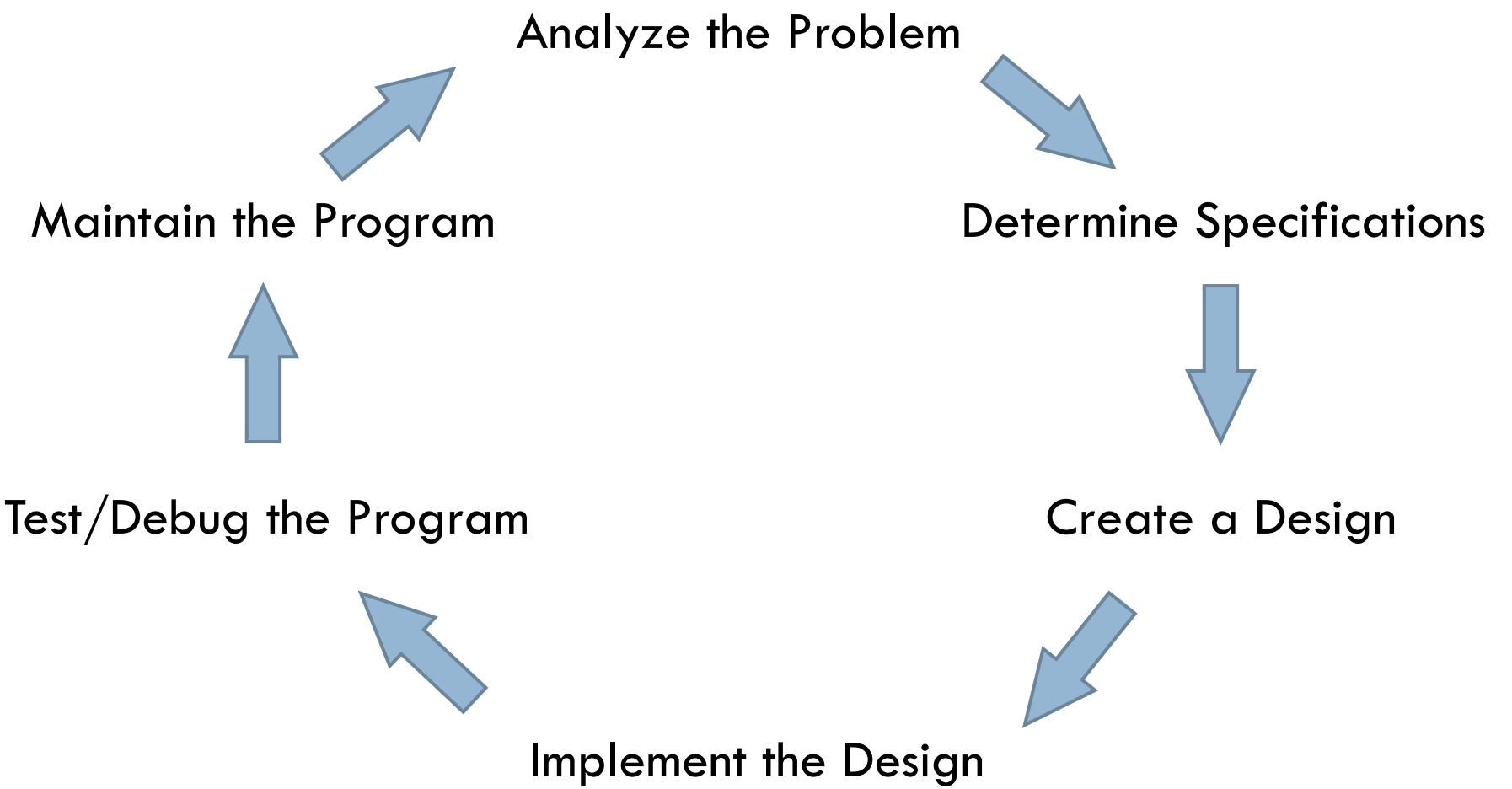
- A partially translated version of your file
- Called *byte code*
- Interpreter saves this to make loading faster next time
- Try double-clicking it!

The Software Development Process



Road Trip!

The Software Development Process



Identifiers: Names in Programs

- Uses of *identifiers* so far…
  - Modules
  - Functions
  - Variables
- Rules for identifiers in Python
  - Start with a letter or _ (the "underscore character")
  - Followed by any sequence of letters, numbers, or _
- Case matters! spam ≠ Spam ≠ sPam ≠ SPAM
- Choose descriptive names!

Q6a

Reserved Words

- Built-in names
- Can't use as regular identifiers
- Python reserved words:

and	del	for	is	raise
assert	elif	from	lambda	return
break	else	global	not	try
class	except	if	or	while
continue	exec	import	pass	with
def	finally	in	print	yield

Be careful not to redefine function names accidentally

- Examples:
  - len – used to find the number of items in a sequence
  - max
  - min
  - float – used to convert a number to a floating point number

Expressions

- Fragments of code that produce or calculate new data values
- Examples
  - *Literals*: indicate a specific value
  - *Identifiers*: evaluate to their assigned value
  - *Compound* expressions using *operators*: +, -, *, /, **
- Can use parentheses to group

Programming Languages

- Have precise rules for:
  - Syntax (form)
  - Semantics (meaning)
- Computer scientists use *meta-languages* to describe these rules
- Example…

Output Statements

- Syntax:
  - `print`
  - `print <expr>`
  - `print <expr>, <expr>, …, <expr>`
  - `print <expr>, <expr>, …, <expr>,`
- Semantics?
- Is this allowed?
  - `print "The answer is:", 7 * 3 * 2`

A "slot" to be filled with any expression

Repeat indefinitely

Note: trailing comma

Homework

- Hand in Quiz
- On Angel
  - Lessons → Homework → Homework 2 → Homework 2 Instructions
  - (or just follow link from Schedule page, that's what I do)
  - Reading and ANGEL quiz due Thursday.
    Programming part due Friday.