Administrivia
Homework #2 is due Friday Sep. 9.
Labs resume next week.
Warmup Quiz
s = '%f'
i = 3 / 6
x = float(s%i) * 2

What is the value of x?
A '0.50.5'
B '%f%f'
C 1.0
D '1.0'
s = "WATER MAIN"[2:6]
t = int(3.7)
x = s[-1] + s[t-2]

What is the value of x?
A "NA"
B "E"
C "R"
D "ME"
s = "WATER MAIN"[2:6]
    #0123456789
s = "TER "
t = int(3.7)
t = 3
x = s[-1] + s[t-2]
x = " " + "E"
x = " E"
i = len("WATER MAIN")
c = (1.0 + 2.0j) * (-i)
x = abs( min( c.real, -13 ) )

What is the value of x?
A 0
B 11
C 12
D 13
Functions Redux
Functions

- A small program (block of code) we can run within Python.
  - Saves us from rewriting code
  - Don’t reinvent the wheel!
- Analogy: Functions are more verbs.
- Also called subroutine or procedure.
When we want to execute a function, we call or invoke it.

Use name of the function with parentheses.

- `print()`

Many functions come built-in to Python or in the standard library.

Others we will compose at need.
- **input** is a built-in function.
- Argument: string prompting user
- Return value: input from user (as `str`)
A program should achieve a goal.
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Let’s implement the quadratic equation.
```python
print("QUADRATIC SOLVER")
print("a x^2 + b x + c = 0")

a = float(input('a: '))
b = float(input('b: '))
c = float(input('c: '))

root = (b**2 - 4*a*c) ** 0.5
denom = 2 * a

pos = (-b + root) / denom
neg = (-b - root) / denom

message1 = "%.2f + %.2fi" % (pos.real, pos.imag)
message2 = "%.2f + %.2fi" % (neg.real, neg.imag)

print("Solution 1: %s" % message1)
print("Solution 2: %s" % message2)
```
Achievement unlocked!

Achievement unlocked
Write a program.
Methods
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Use attribute operator on the value.
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"STOP SHOUTING!".lower()
(1 + 1j).conjugate()
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"STOP SHOUTING!".lower()
(1 + 1j).conjugate()

Value is treated like an argument.
"GATTACA".count('A')
"MVEMJSUN".find('J')
"ABACADABRA".replace('AB','G')
'FNORD'.strip()
'high king of narnia'.title()
'wEiRd'.swapcase()
s = "WATER MAIN"
x = s[0:s.find(' ')].lower()
x = x.title().swapcase()

What is the value of x?
A 'wATER'
B 'Water'
C 'wATE'
D 'aTER'
Comments
We can explain our code using comments.
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```python
dx = 0.01  # grid spacing, m
V = 14.2   # voltage, V

""
This is an extended comment.
I can be many lines long.
Use me to explain functions or formulae, to document code, or to temporarily hide blocks you don't want to run.
""
```
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- Comments begin with a `#` sign; Python ignore the rest of the line.
- Long comments can also be stored as triple-quoted strings.
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Reminders
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