Python Basics!

arguments, parameters, methods, comments

CS101 Lecture #5

2016-09-07

Administrivia

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- Homework #2 is due Friday Sep. 9.
- Labs resume next week.

Warmup Quiz

Question #1

```
s = '%s' + 'i'
i = 3 / 6
x = float(s%i) * 2
```

What is the value of x?

A `0.0`
B `'%i%i'`
C `1.0`
D `'1.0'`

Question #2

```
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”

Question #3 (Worked)

```
s = "WATER MAIN"[2:6]
    #0123456789
s =   "TER "
t = int(3.7)
t = 3
x = s[-1] + s[t-2]
x = " "   + "E"
x = " E"
```

Question #4

```
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.

Function calls

- 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.

User input

- `input` is a built-in function.
- Argument: string prompting user
- Return value: input from user (as `str`)

Goal

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- Let's implement the quadratic equation.

Example: Quadratic equation

```
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!

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(1 + 1j).conjugate()
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- Use attribute operator on the value.

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(1 + 1j).conjugate()
```

- Value is treated like an argument.

String methods

```
”GATTACA”.count(’A’)
”MVEMJSUN”.find(’J’)
”ABACADABRA”.replace(’AB’,’G’)
’ FNORD ’.strip()
’high king of narnia’.title()
’wEiRd’.swapcase()
```

Example

```
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

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```
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 d
or to temporarily hide blocks you don't want
"""
```

Reminders

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