CS-105
1) The Python Shell (a.k.a. Python Console)
2) Expressions
3) Variables and the Assignment Statement

Instructor: Joel Castellanos
e-mail: joel@unm.edu
Web: http://cs.unm.edu/~joel/
Office: Farris Engineering Center 319

Assignments

- Due Tuesday, Aug 25 (for class):
  - Read Invent Your Own Computer Games with Python, 2nd Edition
    Chapter 4: GUESS THE NUMBER

- Due Wednesday, Sept 2 (midnight):
  - Lab 2: Modified Guess The Number
Quiz: Python Math Mathematics Operators

In the Python programming language, the mathematics operators for addition, subtraction, multiplication and division are:

a) +, −, *, and /

b) +, −, x, and ÷

c) +, −, x, and ÷

d) +, −, x, and ≈

e) +, −, x, and \n
Integers and Floating Point Numbers

In programming (and also in mathematics), whole numbers like 4, 0, and 99 are called integers.

Numbers with fractions or decimal points (like 3.5 and 42.1 and 5.0) are not integers.

In Python, the number 5 is an integer, but if we wrote it as 5.0 it would not be an integer.

Numbers with a decimal point are called floating point numbers.

In mathematics, 5.0 is still considered an integer and the same as the number 5, but in computer programming the computer considers any number with a decimal point as not an integer.
How to Read a Computer Programming Book

1) Sit down at a desk with working space.
2) Turn on your computer and start up PyCharm.
3) Open your Textbook.
4) Read a bit.
5) Type the examples from the book into PyCharm.
6) If it does not work, try again.
7) Think of something you might change and try to guess what the result will be. Then try it.
8) Think of something you want to do that is slightly different from what the example does, ..... and do it.
9) Then, read a bit more....

A Python Expression

A Python expression is made up of values and operators.
The Python Shell (a.k.a. Python Console)

Click here to show the Python Console.

Quiz: The Last Expression Evaluates to?

```python
>>> foo = 5
>>> foo = 10
>>> Foo = 20
>>> foo + Foo
```

a) 15  
b) 25  
c) 30  
d) 35  
e) 40
Storing Values in Variables

```python
>>> eggs = 15
>>> fizz = 10
>>> eggs + fizz
25
```

In Python, `=` is the assignment operator.

Changing the Value Stored in a Variable

```python
>>> fizz = 5
>>> fizz = 10
>>> print(fizz)
10

>>> fizz = fizz + 1
>>> fizz = fizz + 2
>>> print(fizz)
13
```
**PytHoN iS CasE SensiTiVe**

```python
>>> foo = 10
>>> Foo = 20
>>> foo + Foo
>>> print(foo, Foo, foo)
10 20 10

>>> print(foO)
NameError: name 'foO' is not defined
```

**Quiz: Evaluating an Expression**

What is the value of the 4\textsuperscript{th} Python 3.4 expression below?

```python
>>> a = 2
>>> b = 3
>>> c = 5
>>> a + b + b + c
```

a) a+b+b+c  
b) a + b + b + c  
c) abbc  
d) 13  
e) 2335
Order of Operations

>>> 2 + 3 * 10
32

>>> (2 + 3) * 10
50

Quiz: Evaluating an Expression

What is the value of the Python 3.4 expression below?

```python
>>> 1 + 2 * 5
```

a) 1+2*5  
b) 125  
c) 15  
d) 11  
e) 1212121212
In Python, the + Operator is *Overloaded*

\[ \text{5 + 5} \]
\[ = 10 \quad + \text{ means } \text{Addition}. \]

\[ \text{'Joel' + '5'} \]
\[ = \text{'Joel5'} \quad + \text{ means } \text{Concatenation}. \]

\[ \text{'5' + '5'} \]
\[ = \text{'55'} \]

\[ \text{5 + '5'} \]
\[ \text{TypeError: unsupported operand type(s) for +: 'int' and 'str'} \]

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**Quiz: Evaluating an Expression**

What is the value of the 4\textsuperscript{th} Python 3.4 expression below?

\[ \text{a = '2'} \]
\[ \text{b = '3'} \]
\[ \text{c = '5'} \]
\[ \text{a + b + b + c} \]

\text{a)} 'a+b+b+c'
\text{b)} 'a + b + b + c'
\text{c)} 'abbc'
\text{d)} '13'
\text{e)} '2335'
Incrementing Variables

guessesTaken = guessesTaken + 1

- When one is added to a variable, programmers say: "the program is **incrementing** the variable" (because it is increasing by one).

- When one is subtracted from a variable, programmers say: "the program "is **decrementing** the variable" (because it is decreasing by one).

Quiz: What is the output

1) a = 5  
2) b = 2 + 2 + 5  
3) a = a + b  
4) b = 1  
5) print(a)  
6) print(b)

<table>
<thead>
<tr>
<th></th>
<th>a) 14</th>
<th>b) 5</th>
<th>c) 5</th>
<th>d) 5</th>
<th>e) 6</th>
</tr>
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<td>1</td>
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