LAB #4
Expressions and Built-in Functions

1. **Pre-Lab/Groupwork:**
   Sticking with paired programming in our labs, get into a group of 2 (maybe try to meet/pair with someone different), and discuss how you would solve each expression based on precedence. In addition, we will follow the standard in most programming languages, where integer arithmetic is a result from using only integers. The special operator for integer division, //, is a new feature of Python 3, but this is not typical in most languages. In the following expressions, assume integer division when a divide is between integers, when determining your answers.

   \[
   4 / 3 / 2 \\
   4 / 3.0 / 2 \\
   1 / 2 * 8.0 \\
   5 * 10 / 2 + 10 / 5.0 \\
   3 + 2 * 4 / 5 + 8 + 2 \\
   (3 + 2) * 4 / (5 + 8) + 2 \\
   (3 + 2) * 4 / 5 + (8 + 2) \\
   20.0 / 4 * 2^3 \\
   5.5 * 2 + 4 / 2 \\
   false and true \\
   not false \\
   true or false \\
   not true or false and false or true \\
   not ((true or false) and (false or true)) \\
   not true and false \\
   not (true and false) \\
   false and not false or false
   \]
Using variables:

\[
a = 0.0 \\
b = 1.0 \\
b - a \div 10 \\
(b - a) \div 10 \\
a = \text{true} \\
b = \text{false} \\
\text{not } a \text{ or not } b
\]

Now, look up the ASCII character set in a web browser or your book, p. 470-472. Determine the numbers that correspond to the letters in your full name. This includes a capital letter for your first and last name with a capital middle initial (if you have one) followed by a period, i.e. Jennifer Parham-Mocello or Jennifer R. Parham. Write down the numbers for both you and your partner.

**NOTE: Make sure that both members in your group put their name on the piece of paper to get full credit for being in the lab!

2. Testing your solution: Write Python code to test your handwritten solutions.

Start a new Python project in Visual Studio. If you have not been able to get Visual Studio to work but have downloaded Python, then use the built-in Python IDLE. (Go to Python 3.2-> IDLE (Python GUI)).

Using integer division, i.e. \(//\) or type casting w/ int(), where appropriate, write a python program that prints the values of the above expressions based on the rules for integer arithmetic. Remember, the rule is that an operation between two integers produces an integer.

**Example ways to write 1st expression:**

\[
\text{print}(4 // 3 // 2) \\
\text{print}(\text{int}(\text{int}(4 / 3) / 2))
\]

Now, write a python program that uses the ordinal values from the ASCII character set, and then prints the characters corresponding to the values. Your name should come out with the letters beside each other and spaces between your first, middle
initial, and last name. In other words, you do not want the print function to automatically insert a newline at the end.

**Example:**

```python
print(chr(79), end="")
```

**Compare your handwritten solutions with your Python solutions** to see if you got the correct answer. For those answers where your handwritten solution differed from the Python solution, document what caused this error. For example, did your make a typo when entering the number in Python or a logical error when calculating your solution by hand?

3. In order to receive credit for your lab, show your Python code to a lab TA before leaving the lab, **otherwise you’ll receive zero points!!**