Like the first Competency Demo, this CD will be on Blackboard and will mostly feature true/false and multiple-choice questions with the possibility of a few short answer questions.

The Competency Demo is closed-notes, closed-book, etc.

You will take it on your time and on your honor between Friday, October 13 and Sunday, October 15.

1. Given the name for a variable, indicate whether it is a legal name in python (does it follow the rules of syntax).
   - Which of the following are valid variable names in Python?
     i. home_address
     ii. Age
     iii. return
     iv. var1.3
     v. 4square
     vi. route66

2. Given one or more mathematical expressions using the python mathematical operators, indicate the result.
   - What is the resulting value of the following mathematical expressions when evaluated in Python?
     i. \((2 + 3 * 5) - 4 / 2\)
     ii. \(12 - 3 * 2 + 13 \div 3\)
     iii. \(4 ** 3 - 1\)
     iv. \(4.0 / 10 + 2 * 3.5\)
     v. \(10 \% 4 + 7 / 2\)

3. Describe the function of the three Python division operators.
   - What is the resulting value of the following mathematical expressions when evaluated in Python?
     i. \(27 / 5\)
     ii. \(27 \div 5\)
     iii. \(27 \% 5\)
• Explain the process for what happens with each of the following operators.
  i. /  
  ii. //  
  iii. %

4. Given one or more statements that set the value of a variable, indicate the data type of the variable.
• What is the resulting data type of the following mathematical expressions when evaluated in Python?

\[
\text{var1} = (2 + 3 \times 5) - 4 / 2 \\
\text{var2} = 12 - 3 \times 2 + 13 // 3 \\
\text{var3} = 4 ** 3 - 1 \\
\text{var4} = 4.0 / 10 + 2 * 3.5 \\
\text{var5} = 10 \% 4 + 7 / 2 \\
\]

5. Given one or more statements, indicate the value(s) in one or more variables upon completion of the statements.
• What values are stored in x and y after the following code is executed?

\[
x = 13 \\
y = x \\
x = 7 \\
\]

6. Given a Boolean expression using one of the six Boolean operators (<, <=, >, >=, == or !=), indicate the evaluated output (True or False).
• What is the resulting value of each of the following Boolean expressions when evaluated in Python when x=7, y=9, and z=16?

\[
x < y \\
x > y \\
x + y == z \\
z - y <= x \\
x >= z \\
y != z \\
\]

7. Given a compound Boolean expression (one that includes one or more of AND, OR, or NOT, indicate the evaluated output (True or False).
• What is the resulting value of each of the following Boolean expressions when evaluated in Python when \( x=7, y=9, \) and \( z=16 \)?

\[
\begin{align*}
&x < y \quad \text{and} \quad x > y \\
&x + y == z \quad \text{or} \quad z - y <= x \\
&\text{not} \quad x >= z
\end{align*}
\]

8. Explain the difference in Python between = and ==.

9. Given a small script (including data with values) containing an if statement, indicate the output of the script.

What is printed by the following script?

```python
x = 7
y = 13
print("TRUE")
if x + 4 < y:
    print("TRUE")
else:
    print("FALSE")
print("FALSE")
```