Practice Week 01

Exercise 1: Make a script

Recall the "Hello World" program from the lecture notes. For this exercise, do the following:

1. Create a script (e.g. "Hello_World.py") in your Python editor that contains this code, and make sure you can successfully run the script.

2. Edit your script file to prompt the user for their name (and any other information you might be interested in) and then output to the scree a greeting that includes their name and this other information.

Exercise 2: Comparison Operators

What is the output of variable `res` in each case. Assume `x`, `y` and `z` take the values as shown below. Try to answer the question "manually", then check yourself by running the code in Python.

```
x = 5
y = 1
z = 5

# what is value of "res" for each line below?

res = x < y

res = x == z

res = y < x and z < y

res = y < x or y == z
```

Exercise 3: Logic Evaluation

Using what you have learned about Comparison Operators and Boolean expressions, complete the following tables. Again, try to get results "manually" then theck yourself by running code in Python.

a	b	a < b or a + b < 10	a	b	not a < b or a + b < 10
1	1		1	1	
5	5		5	5	
4	3		4	3	
7	9		7	9	
3	4		3	4	

a	b	a < b and a + b < 10	a	b	not(a < b or a + b < 10)
1	1		1	1	
5	5		5	5	
4	3		4	3	
7	9		7	9	
3	4		3	4	

Exercise 4: Boolean Practice

Write compound Boolean conditions to test for the following:

1. An integer variable `count` being in the range 0 to 20 inclusive. Test your code for different values of `count`, e.g. `count = 10` or `count = 25`.
2. An integer variable `count` being outside of the range 0 to 20 inclusive.
3. Whether the three integer values `s1`, `s2`, `s3` are valid lengths for the sides for a triangle. This requires that all three are greater than zero, and that the sum of any two is greater than the third value.
4. Assuming `s1`, `s2`, `s3` are valid lengths for the sides of a triangle (from part 3 above), is the triangle equilateral? That is, are all sides the same length?
5. Assuming `s1`, `s2`, `s3` are valid lengths for the sides of a triangle (from part 3), is the triangle isosceles? That is, are only two sides the same length?
6. Assuming `s1`, `s2`, `s3` are valid lengths for the three sides of a triangle (from part 3), is the triangle scalene? That is, are all sides of different lengths? *Note:* there are at least two different general approaches to writing this last statement – see if you can figure out two different ways to do this!

Exercise 5: Syntax checking

Find any syntax errors in the following:

```
# Program A
if a < b:
  print('a is larger than b')
else:
  print('b is larger than a')
  b -= a
    a += 1
print('a=', a, 'b=', b)


# Program B
if a + b > 3:
    if b < 5:
        print(b)
    elif a > 2
        print(a)
      else:
        print(a + b)
else
        print(a - b)
print(a, b)
```

Rewrite the code to make them run correctly.

Exercise 6: Random Number Generation

1. In a script, write code to generate a random number between 1 – 10. Display the random number to the screen as follows:

```
## The random number: 9
```

2. Modify your program so that it first asks (prompts) the user to guess the random number and prints the guess to the screen. After the user's guess has been printed, the randomly generated number between 1-10 is displayed to the screen.

Exercise 7: Ternary expressions

1. Write a piece of code that prompts a user for two numbers. Using a ternary expression, if the first number is larger, output this value and the statement that this is the larger number. Else, output the second number followed with a statement that this number is the larger of the two. E.g. the output can look something like that below (assuming the user input the values 10 and 5):

```
## 10 is larger!
```

2. Write a piece of code that prompts the user for their name. Using a ternary expression, if the name entered is the same as your own name, output the statement "Same as me!". Otherwise, output the statement "Not the same as my name!" or some other cheeky message! *Hint:* you can use the operator `==` to compare strings.

Exercise 8: Game Two-up

A simplified game of Two-up – a traditional Australian gambling game (http://en.wikipedia.org/wiki/Two-up). *Note:* we are not promoting a gambling but do a programming exercise.

General game play : A person is selected as the Spinner. The Spinner tosses two coins in the air until they win or lose.

- Two heads means the Spinner wins.
- Two tails means the Spinner loses.
- Odds (One coin lands with the 'head' side up, and the other lands with the 'tails' side up) means the Spinner throws again. For this exercise you are being asked to write a simplified Two-up simulator.

Write a program which simulates the toss of two coins. If the two coins land heads up, display `Spinner Wins! Two heads!`. If the two coins land tails up, display `Spinner Loses! Two tails!`. Otherwise, display `Throw again!`. Your output should be presented as:

```
## Coin 1: Heads
```

```
## Coin 2: Tails
```

```
## Throw again!
```

```
## Thanks for playing!
```