PWSA Day 1: Python Basics

Benjamin Merlin Bumpus, Tom Wallis, Fionnuala Johnson,
Sofiat Olaosebikan, Alex Pancheva, John Paul, Ify Okoh

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Welcome to PWSAfrica!

Problems

Basics

Reading Challenge 1.

```
a = 5 + 6
```

Reading Challenge 2.

```
height = 5      # 5 meters
mass = 2        # 2 kilograms
gravity = 9.81  # gravitational acceleration is 9.81 m/s^2
potential_energy = height * mass * gravity
```

Reading Challenge 3.

```
a = 5
b = 6
c = a*b
```

Reading Challenge 4.

```
# a = 5
b = 6
c = a+b
```

Problem 5. Now let's try using Python as a calculator.

- Divide 34580235 by 17.
- What's 13 to the power of 4?
- What's the remainder of 147 by 11?

Problem 6. Implement Reading Challenge 2.

Problem 7. Convert a temperature in Celsius to Fahrenheit.

```
tempCelsius = 96
#insert expression for Fahrenheit here and store it in
    variable called tempFah (subtract 32 and multiply by 5/9)
print (tempFah)
```

Reading Challenge 8.

```
examResult = 85
if examResult > 85:
    print ("Excellent! You've passed")
else:
    print ("Sorry. Try again!")
```

Reading Challenge 9.

```
x = 5
y = False

if (x > 3):
    y = True
```

```
x = 5
y = False

if (x > 3):
    y = True

if (y == False):
    x = 3
```

Problem 10. Using conditionals, print whether a number is odd or even.

Problem 11. Using conditionals and a given temperature, print whether water at this temperature is solid, liquid or gas.

Debugging 12. The following code snippets *may* have errors. Your task is to identify which, if any, errors exist in the code. There may be zero, but there may also be more than one!

Specifically, do the following:

1. Assess the snippet of code and determine what mistakes, if any, exist.

   Work this out without a computer.

2. Once you are certain of your answer, write the program in your computer and check the errors it outputs. Were you correct?

3. Fix the errors in the code, where necessary.

```
if True
    print "true"
```

```
if True or False:
    print("true")
```

```
if true or false:
    print("true")
```

```
condition = True or False
if condition:
    print("true")
```

Reading Challenge 13.

```
shoppingList = ["bread","milk","coffee"]
someNumbers = [22,34,65,70]
print (shoppingList[0])
print (someNumbers[2])
print (someNumbers[-1])
```

Reading Challenge 14. What would be the value of c?

```
a = [2,3,5]
b = [8,11,12]
c = a + b
```

Problem 15.

1. Initialise a list containing the first 10 even numbers.
2. Print out the second element, followed by the last element and the second last element.
   - Index the elements using their exact positions
   - Assign the variable `l` to be the length of the list. Use `l` to find the *last* element in the list.
   - Index the elements using negative indices

Problem 16. Given a list of integers, print the sum of its last two elements.

Problem 17. Using a for-loop, do the following:

- Write out the numbers between 0 and 9
- Write out the numbers between 1 and 10
- Write the numbers backwards between 1 and 10
- Write out all the even numbers between 0 and 50
- Write out all the odd numbers between 0 and 50
- Write all the multiples of 7 less than 100
- Write out all the multiples of 10 counting down from 100 (including 0 and 100)

Debugging 18. The following code snippets *may* have errors. Your task is to identify which, if any, errors exist in the code. There may be zero, but there may also be more than one!

Specifically, do the following:

1. Assess the snippet of code and determine what mistakes, if any, exist.
   Work this out without a computer.
2. Once you are certain of your answer, write the program in your computer and check the errors it outputs. Were you correct?
3. Fix the errors in the code, where necessary.

```
for i in range(100):
    print x
```

```
for i in range():
    print(i)
```

```
for i in range(1, 10):
    print(i)
```

```
for i in range(1, 10, 4, 2):
    i = 5
```