Homework 2: Python Basics I

Description

In this homework, you will continue to hone your understanding of python basics including objects, types, arithmetic operators, and variables.
NOTE: You will need to submit answers to several questions throughout the notebook on Canvas.

Structure

Part 1: Getting Familiar with Google Colab

Part 2: Objects and Types

Part 3: Arithmetic and Variables

Learning Objectives

By the end of this homework, we will:

- Recognize the definition/framework of objects, methods, attributes.
- Recognize the main data types and how to modify them with basic arithmetic operators (+, -, /, *).
- Recognize that variables are a way to store objects.

Resources

- Python Basics Cheat Sheet

Part 1: Reading and Modifying Code

In this section, you will hone your ability to read and modify code given to you.

Problem #1.1

Modify the code to calculate the area of a rectangle whose length is 10 and width is 5.

```
length = 5
width = 4
area = length*width
area
```

```
20
```

Problem #1.2

Modify the code to calculate the `cost_per_person` if the `total_cost` is 500.

```
total_cost = 100
number_of_people = 5
cost_per_person = total_cost/number_of_people
cost_per_person
```

Problem #1.3

Modify the code shown below to calculate the final exam grade needed when:

Exam	Grade	Weight
Exam 1:	75	0.2
Exam 2:	82	0.2

Exam	Grade	Weight
Final Exam:	?	0.6
Final Grade:	85	

```
exam_1_grade = 90
exam_1_weight = 0.25

exam_2_grade = 84
exam_2_weight = 0.3

final_exam_weight = 0.45
wanted_final_grade = 90

required_grade_on_final = (wanted_final_grade- exam_1_grade*exam_1_weight - exam_2_grade*exam_2_weight)/final_exam_weight
required_grade_on_final
```

```
93.99999999999999
```

Part 2: Objects and Types

In this section, you will hone your understanding of the concepts of objects and types.

Problem #2.1

Which of the following objects are floats?

a.

```
5.2
```

b.

```
"this is an object"
```

c.

```
"5.2"
```

d.

```
52
```

e.

```
52 / 10
```

Problem #2.2

Label the following data types.

a.

```
2
```

b.

```
8.9
```

c.

```
"Quantum Computing rocks!"
```

d.

```
["string"]
```

e.

```
5.0
```

Problem #2.3

Which of the following are objects?

a.

```
"28"
```

b.

```
28.5
```

c.

```
num_eggs = 2 * 3
```

d.

```
True
```

e.

```
is_cheese = False
```

Problem #2.4

As discussed in lab, objects consist of two parts: attributes (data) and methods (behaviors). Given that the syntax for both is different, which of the following are attributes?

a.

```
phone.call("Bob")
```

b.

```
phone.time
```

c.

```
phone.change_volume(50)
```

d.

```
students.names_list
```

e.

```
students.sort_by_age()
```

Part 3: Arithmetic and Variables

In this section, you will hone your ability to calculate operations with numerical types and store a range of types in variables.

Problem #3.1

Calculate 50 multiplied by 4.5.

Problem #3.2

Calculate 50 multiplied by 4.5 plus 10.

Problem #3.3

Calculate 4 to the 8th power plus 10.

Problem #3.4

Create a variable that stores the name of the country you live in. Output that variable.

Problem #3.5

Create a variable named `height_cm` and set it equal to your height in centimeters. Output `height_cm`.

NOTE: 1 inch = 2.54 cm.

Problem #3.6

Create a variable named `height_m` and set it equal to your height in m. Use the `height_cm` variable from the previous problem. Output `height_m`.

NOTE: 1 m = 100 cm.

Problem #3.7

Which of the following variables names would not run in python?

a.

```
1var = 10
```

b.

```
2var = 20
```

c.

```
3_var = 30
```

d.

```
Var4 = 40
```

e.

```
VAR5 = 50
```

f.

```
var_6 = 60
```

g.

```
month&year = "July 2022"
```

h.

```
hello = "hello"
```

i.

```
for = "for"
```

Problem #3.8

Create a variable `name` and assign it to your name. Output `name`. Then, reassign `name` to a friend's name. Output again.

End of notebook