Homework 1: Python Basics
Due: Wednesday, February 9th, 11:59PM EST

1 Without Coding (you may not use Python)

Problem 1 (13 points)

Evaluate the following expressions:

1. $11.1 + 12$
2. $10 - 12.1$
3. $5 * *3$
4. $4 * 5$
5. $15/10$
6. $12/20$
7. $15//10$
8. $12//20$
9. $5\%2$
10. $9\%5$
11. $2\%5$
12. $6\%6$
13. $0\%7$

Problem 2 (5 points)

What is the value of the below expression? Show your work

$2 + 10\%3 * (4 - 1) * 20/5 * (2 + 3)$

Problem 3 (5 points)

What is the output of the following code?

```
my_int = 5
my_int *= 3
print(my_int)
```

[*1*]

Problem 4 (6 points)

You see the following code:

```
A = input("Enter number 1")
B = input("Enter number 2")
a = int(a)
b = int(b)
c = a + b
```

[2]

You get the error:
NameError: name 'a' is not defined on line 3.

Why did this happen?

Problem 5 (11 points)

For each of the following expressions, say whether it is valid or invalid in Python. If valid, what simplified value would the left side be assigned to? If invalid, briefly explain why. Assume this is the start of the program and no variables have been defined before.

1. foo = "Hello"
2. bar = True
3. foobar = 1 + 2
4. foobar = "One" + "Two"
5. true = 5
6. foo = test
7. or = 1
8. seven = 1 + "1"
9. six = "1" + 1
10. 1_var = 2
11. var_1 = "foo"

2 Coding Problems

Problem 6 (10 points)

Write a method that will take as input parameters two strings, first_name and last_name, and create a new variable called greeting which will be "Hello, your name is <first_name> <last_name>". Your method must then end by returning the variable "greeting".

It should have the following signature:

```
def say_greeting(first_name, last_name):
    <your code>
    return greeting
```
[*3*]

For example:

```
say_greeting("Joe", "Biden") = "Hello, your name is Joe Biden"
```
[*4*]

Problem 7 (10 points)

Write a letter grade method.
It will take an input of a float and return the letter string.

Score	Letter
93+	A
90-93	A-
87-90	B+
83-87	B
80-83	B-
77-80	C+
73-77	C
70-73	C-
50-70	D
0-50	F

The method signature should be calculate_letter (score). If a score is on the border, give it the higher letter grade.

For example:

```
calculate_letter(81.5) = "B-"
```
[*5*]

Problem 8 (20 points)

Write a method to figure out the day of the week and hour of the day. The input will be the number of hours since Wednesday, January 1st 2020 at 12:00 AM (Midnight). It should return a string that

looks like: “Thursday at 7 PM”

It should have the following signature:

```
def calculate_day(num_hours)
```
[6]

For example:

```
calculate_day(1000) = "Tuesday at 4 PM"
```
[7]

Problem 9 (20 points)

Write a method to calculate the volume of a shape. The first parameter will either be "sphere" or "cone" and the second will be a tuple of non-negative integers either giving just the radius or giving the radius and height in that order. Round the output to the hundredths place (2 decimal spaces).

If the shape is not either "sphere" or "cone" return the string "Invalid Shape".

NOTE: Do not use the Math module to obtain the PI value. Just use 3.14.

The relevant formulas can be found here: https://sciencenotes.org/surface-area-formulas-volume-formulas/.

It should have the following signature:

```
def calculate_volume(shape, dimensions)
```
[8]

For example:

```
calculate_volume("sphere", (5,)) = 523.33
calculate_volume("cone", (3,7)) = 65.94
calculate_volume("prism", (2,2,1)) = "Invalid Shape"
```
[9]

Submission Instructions

Submit 2 files:
hw1.py - For the coding part
hw1.pdf - For the written part

Submit both parts on **Gradescope.**

At the top of **both** hw1. py and hw1.pdf, include the following information:

- Your name
- The name of any classmates you discussed the assignment with, or the words "no collaborators"
- A list of sources you used (textbooks, wikipedia, research papers, etc.) to solve the assignment, or the words "no sources"
- Whether or not you're using the extension option

Grading Methodology

The **written part** of the assignment will be graded for correctness. In the case that your answer is incorrect, partial credit may be awarded based on the provided work.

The **code part** of the assignment will be graded by an automatic grading problem. It will use the method signatures specified in this assignment and will use multiple test cases.

10 extra credit points are available for:

- Descriptive variable names
  - Instead of 'a', 'b', 'c', use 'num_days', 'circle_area', etc.
- Comments for what functions do