**Programming with Python, ISGB 7990**

**Homework I: Compounding Interest Calculator**

**Submission: FirstNameLastNameHomework1.py file**

Start your script with the comment #FirstName LastName Homework1, save the file as FirstNameLastNameHomework1.py, and submit it to blackboard.

**#Part A**

Build a simple calculator for runners to determine how long it will take to run a distance.

1. Ask the user how far she/he will run;
2. Ask the user to enter the desired pace in minutes per mile or kilometer;
3. Calculate how long it will take the user to complete the run; and
4. Print the results.

For simplicity, seconds can be expressed as decimals, for example, 7.5 can be used for 7 minutes 30 seconds.

Output example (if you've coded it correctly, your output should look something like this):

How far will you run?     13.1

How fast will you run (please enter decimal, like 7.5 for 7:30 pace)?        7.25

It will take you 94.975 minutes to run 13.1

**#Part B**

Frequently in business, we want to calculate the future value of an investment or loan after interest has compounded. The equation to do this is:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Where  A is the future value,

P is the principal (initial amount invested or borrowed)

r is the annual rate of interest as a decimal

n is the number of times the interest rate compounds per year

t is the term of the loan or the number of years before it is repaid

We want to build a calculator that will:

1. Ask the user to input the values for the variables above;
2. Perform the calculation; and
3. Print the following string to the user:

> In [t] years, at the interest rate of [r] compounded [n] times per year, the initial amount of [P] will be worth [A]
>
> Example:
>
> In 5 years, at the interest rate of 5% compounded 4 times per year, the initial amount of $5000.00 will be worth $6410.19

Note that the figures in this string have been formatted to include only two decimals and a dollar symbol.

You can check the results of your script by using an online future value calculator, like this one. If you do so, leave the annual addition amount at 0 and select 'start' as the 'Make additions at' option.

Output Example:

> Please enter principle:
>
> 4000
>
> Please enter annual interest rate (example 5.2 for 5.2%):
>
> 5.2
>
> Please enter the term in years:
>
> 5
>
> Please enter number of times the interest will compound per year:
>
> 365
>
> In 5.0 years, at the interest rate of 5.2% compounded 365 times per year, the initial amount of $4,000.00 will be worth $5,187.62.

**Extra challenge:**

If this assignment was easy, you can also calculate the amount paid to interest. Extra challenges are not necessary to receive full credit on homework and labs.

Extra Challenge Output example:

In 5.0 years, at the interest rate of 5.2% compounded 365 times per year, the initial amount of $4,000.00 will be worth $5,187.62. $1,187.62 will be paid in interest.