CSCE 1035 Lab 03 Fall 2021

1. **zyBooks Labs**

   Please follow the link on Canvas to complete the following zyBooks labs:

   - 2.12 *LAB: Divide by x*
   - 2.13 *LAB: Driving costs*
   - 2.14 *LAB: Expression for calories burned during workout*
   - 2.15 *LAB: Using math functions*
   - 2.16 *LAB: Musical note frequencies*
   - *2.17 LAB: Warm up: Variables, input, and type conversion*
   - *2.18 LAB: Program: Cooking measurement converter*

2. **Writing a Python 3 Program to Calculate Effective Interest Rate**

   The effective interest rate is a rate that is equivalent to a simple interest rate that would produce the same amount of interest for one year as if the monetary amount were compounded for one year. The following formula converts an annual nominal interest rate to the effective yield:

   $$\text{Effective Yield} = \left(1 + \frac{r}{n}\right)^n - 1,$$

   where r = interest rate in decimal form and n = number of compounding periods per year.

   Write a small, but complete Python3 program called **Lab3A.py** that calculates the effective interest rate, also known as the effective yield, using user input of the interest rate and the number of compounding periods per year.

   a. Prompt for and read in the interest rate as a floating-point number percent. For example, an 18.9% interest rate should be read in as 18.9.

   b. Convert the interest rate to its decimal equivalent by dividing the interest rate by 100 using the shorthand compound operator (e.g., `/=`).

   c. Prompt for and read in the number of compounding periods per year as an integer. For example, if the rate is compounded monthly, then the number of compounding periods per year would be 12.

   d. Calculate the *Effective Yield* using the formula given above with the built-in `pow()` function where the $(1 + \frac{r}{n})$ is the base argument and n is the exponent argument.

   e. Convert the *Effective Yield* result back to a percent by multiplying by 100 using the shorthand compound operator (e.g., `*=`).

   f. Print the effective interest rate to the terminal, formatting the original and effective interest rates to three decimal places and the % sign as shown in the example. Since we divided the interest rate input by the user, you will need to

multiply the original interest rate by 100 to print out correctly as shown, but do so in the `print()` statement itself.

For example, the output might look like this (input shown in **bold**):

```
$ python3 Lab3A.py
Enter interest rate as a percent: 18.9
Enter number of compounding periods per year: 12
18.900% interest with 12 compounding periods has an Effective
Yield of 20.626%
```

Before writing the code, you may want to compute a hand example to verify that your program solution is correct and matches your example. *Note that you will submit this file to Canvas.*

Now that you have completed this lab, it's time to turn in your results. Once you've moved the files to your windows machine (using **WinSCP**), you may use the browser to submit them to Canvas for the **Lab 03** dropbox.

You should submit the following files:

- **`Lab3A.py`**
- **(Note that the zyBooks labs are submitted separately through Canvas.)**

If you have any questions, ask your TA to check your results before submission.

Now that you've finished the lab, use any additional time to practice writing simple programs out of the textbook, lectures, or even ones you come up with on your own to gain some more experience.