ENGR 102 – Fall 2021
Lab Assignment #7b

Deliverables:

There are four deliverables for this individual assignment. Please submit the following files to Mimir:

- `Lab7b_Act1.py`
- `Lab7b_Act2a.py`
- `Lab7b_Act2b.py`
- `Lab7b_Act3.py`

Activity #1: *The Name Game* (**https://en.wikipedia.org/wiki/The_Name_Game**)

This program is meant to help give you practice with string manipulation. The Name Game is a rhyming game that creates variations on a person's name. Using a person's name, the first syllable is replaced with various sounds in the pattern below where X is the full name and Y is the name without the first consonant sound.

```
(X), (X), Bo-B(Y)
Banana-Fana Fo-F(Y)
Me Mi Mo-M(Y)
(X)!
```

Write a program named Lab7b_Act1.py that reads in a name from the user, then prints the rhyme using the output format shown below. User input is shown in bold and red text. For names that begin with a vowel sound, the first syllable is **not** dropped, but is converted to a lowercase letter (See Example Output #2.)

✓ Example output #1 (using input **Niki**)

```
What is your name? Niki
Niki, Niki, Bo-Biki
Banana-Fana Fo-Fiki
Me Mi Mo-Miki
Niki!
```

✓ Example output #2 (using input **Aaron**)

```
What is your name? Aaron
Aaron, Aaron, Bo-Baaron
Banana-Fana Fo-Faaron
Me Mi Mo-Maaron
Aaron!
```

Activity #2: *Pretty printing*

The following activities are based on selected exercises from Chapter 7 in the zyBook. You **DO NOT** need access to the zyBook to complete these activities. Please name your files Lab7b_Act2a.py and Lab7b_Act2b.py.

➢ **Part A:** *For loop - Printing a list*

Write the Python code to perform the following tasks:

- Take as input from the user a string of three or more prices separated by spaces
- Convert the string into a Python list of floats
- Print each price in the list on a separate line with a dollar sign ($) in front
- Print the output such that the decimal points are aligned vertically

✓ Example output (using input **1.23 23.45 345.56**):

```
Enter three or more prices separated by spaces: 1.23 23.45 345.56
$   1.23
$  23.45
$ 345.56
```

➢ **Part B:** *Hourly temperature reporting*

Write the Python code to perform the following tasks:

- Take as input from the user a string of three or more temperatures separated by spaces
- Take as input from the user a two-character string to use as a separator during printing
- Write a loop that will print all elements of the list to the same line on the display
    - Each element should be separated from other elements by the user-chosen separator characters including a space on each side. The space and separator should not be printed after the last number.

✓ Example output (using input **101.2 93.5 85.6** and **->**):

```
Enter three or more values separated by spaces: 101.2 93.5 85.6
Enter a two-character separator: ->
101.2 -> 93.5 -> 85.6
```

Activity #3: Vector Math

This program is meant to give you practice with lists and looping on them, as well as practice with vector computations. Write a program named Lab7b_Act3.py that lets a user enter two vectors, A and B, of the same arbitrary dimension and store each vector as a Python list. Have the user enter each vector in one line with spaces between elements. Then, you should output the results of these computations using the format shown below. Print any resulting lists to include `[]` and `,`.

- The magnitude of vector A and the magnitude of vector B printed to four (4) decimal places
- A + B
- A – B
- The dot product (inner product) of A and B

Note: You should use **lists** (and loops) when solving this problem. You may **NOT** use sympy or numpy. Later we will see some other ways to work with vectors more directly.

✓ Example output (using vectors A = [1, 2, 3] and B = [4, 5, 6]):

```
Enter the elements for vector A: 1 2 3
Enter the elements for vector B: 4 5 6
The magnitude of vector A is 3.7417
The magnitude of vector B is 8.7750
A + B is [5.0, 7.0, 9.0]
A - B is [-3.0, -3.0, -3.0]
The dot product is 32.0
```