At this point, you only need to know how to use Jupyter Notebook to write, compile, and run your program.

Lists/Arrays

A list is a data structure in Python that is a mutable, or changeable, ordered sequence of elements. Each element or value that is inside of a list is called an item. Just as strings are defined as characters between quotes, lists are defined by having values between square brackets [ ]. The following assignments should implement the concepts of Python Lists.

Question #1

Write a program called *SellItems.* The program should allow the user to enter any item prices, calculate the total, and apply a 7% sales tax. The item prices should be stored in a Python list, and a loop should be used to get the input and calculate the total. The output should include a list of item prices, the subtotal of the prices, the tax amount, and the final cost. Display all results in two decimal places. Create at least two functions and save those functions into a separate file (the file that you created in your previous assignment). Import the file into your main program.

Question #2

(*Algebra: multiply two matrices*) Write a function to multiply two matrices. The header of the function is:

```
def multiplyMatrix(a, b)
```

To multiply matrix **a** by matrix **b**, the number of columns in **a** must be the same as the number of rows in **b**, and the two matrices must have elements of the same or compatible types. Let **c** be the result of the multiplication. Assume the column size of matrix **a** is **n**. Each element c_{ij} is $a_{i1} \times b_{1j} + a_{i2} \times b_{2j} + \ldots + a_{in} \times b_{nj}$. For example, for two 3×3 matrices **a** and **b**, **c** is

$$\begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix} \times \begin{pmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{pmatrix} = \begin{pmatrix} c_{11} & c_{12} & c_{13} \\ c_{21} & c_{22} & c_{23} \\ c_{31} & c_{32} & c_{33} \end{pmatrix}$$

where $c_{ij} = a_{i1} \times b_{1j} + a_{i2} \times b_{2j} + a_{i3} \times b_{3j}$.

Write a test program that prompts the user to enter two 3×3 matrices and displays their product. Here is a sample run:

```
Enter matrix1: 1 2 3 4 5 6 7 8 9 ↵Enter
Enter matrix2: 0 2 4 1 4.5 2.2 1.1 4.3 5.2 ↵Enter
The multiplication of the matrices is
 1 2 3      0 2.0 4.0      5.3 23.9 24
 4 5 6   *  1 4.5 2.2  =   11.6 56.3 58.2
 7 8 9      1.1 4.3 5.2    111.9 88.7 92.4
```

Write a Report Summary

Using Microsoft Word or any text editor, answer the following questions. Please describe your answers, do not just say yes or no.

1. Did you complete your assignment and did your program run without errors?
2. Did your program produce the correct result?
3. Did you test your program thoroughly?
4. How much time did you spend completing your assignment?
5. Did you write the program yourself? Did you get any help from anyone?
6. How did you resolve the issues when you encountered obstacles to completing your program? Did you use Google or other resources to get help? Describe how Google or other resources was abled or not able to assist you.
7. What did you learn from doing this assignment?
8. Any other information you would like to share with your instructor?

What to submit

1. Submit your Python Jupyter files (.ipynb file)
2. Submit your program output (screenshot images)
3. Submit your learning report summary