CSCE 1035 Lab 06 Fall 2021

1. **zyBooks Labs**

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

   - 20.1 *LAB: Count multiples*
   - 20.2 *LAB: Find largest number*
   - 20.3 *LAB: Hailstone sequence*
   - 20.4 *LAB: Output numbers in reverse*

2. **Working with Loops**

   Write a loop that prints the product and sum of user entered numbers. The user will enter a set of numbers. The program will then print the product of the numbers entered and the sum of the numbers.

   Write a small, but complete Python3 program called **Lab6A.py** that computes and prints out the sum and product of a set of numbers as follows:

   a. Create an empty list

   b. Use a while loop to read the users numbers. Exit the loop when the user types ***done***.

      - Prompt for and read a string.
      - If the string is the word ***done***, exit the loop
      - Convert the input to a number and add it to the list.
      - Multiply the number by the current product and save it for the next round.
      - Add the number to the current product and save it for the next round.

   c. Initialize a sum to zero.

   d. Use a for loop to print out the numbers separated with a plus signs and calculate the sum.

      - Loop through the list of numbers
      - If this is the first number print it otherwise print a + sign followed by the number.
      - Add the current number to the sum.

   e. Print an = sign followed by the sum of the numbers.

   f. Initialize a product to one.

   g. Use a for loop to print out the numbers separated asterisks (*) and calculate the product.

      - Loop through the list of numbers

- If this is the first number print it otherwise print an asterisk followed by the number.
- Multiply the current number to the product.

h. Print an = sign followed by the product of the numbers.

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

```
$ python3 Lab6A.py
Enter numbers to calculate product and sum
Enter done when all of the numbers have been entered

Enter the next number, Type 'done' to calculate: 4
Enter the next number, Type 'done' to calculate: 5
Enter the next number, Type 'done' to calculate: 6
Enter the next number, Type 'done' to calculate: done
4 + 5 + 6 = 15
4 * 5 * 6 = 120
```

Note that you will submit this file to Canvas.

3. Nested loops

In this lab component, you will explore working with nested loops by creating a multiplication table. Hint. Use f strings or formatted strings to get the spacing correct

a. Prompt the user for the size of the multiplication table.

b. Print the column heading

- Print "x |"
- Loop for each number from 1 to the size the user entered print the number for the heading. This is the first row of the heading.
- Print "--+"
- Loop to print a row of "----" based on the size

c. Create an outer loop that goes from 1 to the size the user entered.

- Print each row
    - Print the row number follow by "|"
    - Create an inner loop to print the products of the row and column

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

```
$ python3 Lab6B.py
Size of multiplication table: 4
x |  1   2   3   4
--+----------------
 1|  1   2   3   4
 2|  2   4   6   8
 3|  3   6   9  12
 4|  4   8  12  16

$ python3 Lab6B.py
Size of multiplication table: 12
x |  1   2   3   4   5   6   7   8   9  10  11  12
--+------------------------------------------------
 1|  1   2   3   4   5   6   7   8   9  10  11  12
 2|  2   4   6   8  10  12  14  16  18  20  22  24
 3|  3   6   9  12  15  18  21  24  27  30  33  36
 4|  4   8  12  16  20  24  28  32  36  40  44  48
 5|  5  10  15  20  25  30  35  40  45  50  55  60
 6|  6  12  18  24  30  36  42  48  54  60  66  72
 7|  7  14  21  28  35  42  49  56  63  70  77  84
 8|  8  16  24  32  40  48  56  64  72  80  88  96
 9|  9  18  27  36  45  54  63  72  81  90  99 108
10| 10  20  30  40  50  60  70  80  90 100 110 120
11| 11  22  33  44  55  66  77  88  99 110 121 132
12| 12  24  36  48  60  72  84  96 108 120 132 144
```

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 06** dropbox.

You should submit the following files:

- **`Lab6A.py`**
- **`Lab6B.py`**
- **(Note that the zyBooks labs are submitted separately through Canvas.)**

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.