Lab 3.0
Loops

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Goals

The goal of this lab is to practice using Python 3. Specifically, you will practice:

- Loops

Instructions

All work is due at the **end of your lab** and must be submitted to Brightspace in the proper place. Unless otherwise instructed, submissions must be python files (e.g. files that end with *.py*). Any other format, even if it is plain text, will **not** be graded. Messy or otherwise unreadable code will lose points. Lab submissions can be all in the same file, but please label with comments to which task code belongs. IMPORTANT: Any code that is commented out will not be graded. **RUN YOUR CODE TO MAKE SURE IT WORKS!!!**

Task 1 - While Loops

Convert the following to Python code.

A Write a while-loop that prints all odd numbers between 0 and 100.

B Ask the user for two integers, *numA* and *numB*. Write a pair of **nested** while-loops. The outer loop should iterate *numA* times and the inner loop should iterate *numB* times. Each time the outer loop iterates, the message "Outer" should print. And each time the inner one iterates the word, "Inner" should print.

C Recall the previous lab task in which you asks the user to type 'q' to end a while-loop. Now you are going to do the same thing but with nested loops. The outer loop should prompt the user to enter a single character. If the character is 'q', the outer loop should quit. Likewise the inner loop should prompt the user for a word. If the user types 'quit', the inner loop terminates. IMPORTANT: Quitting the inner loop should not quit the outer loop. And the user should be able to reenter the inner loop repeatedly. Each loop should print a message (example, "OUTER" or "INNER") about which loop the user is in.

Task 2 - For Loops

Convert the following to code. You will need the following list for parts B and C respectively:

```
listB = ['cat', 'dog', 'bunny', 'squirrel', 'bear', 'pig']
listC = [2, 5, 99, 3, 101, -99, 0, 4]
```

A Write a for-loop that prints all the even numbers between 1 and 100, inclusive.

B Given *listB* above, write two for-loops (not nested...one after the other). The first one should iterate and print each item in the list using an index to access the list. The second should iterate over the list without using indices.

C Given *listC* above, write a for-loop that iterates through listC and finds the largest number in the list. When the loop finishes, print the largest value. As an extra, also print the index where the largest value is stored in the list.

Task 3 - Reading Loops

In this section you will practice reading code which loops forward or backward through a list or lists of lists. Read each of the code blocks and determine what is printed. Once you have a solution, copy/paste the code into your editor and run it to check your answer.

[A]

```
first_names = ['Lisa', 'Bob', 'Carl', 'Mohammed', 'Vlad', 'Aina']
last_names = ['Smith', 'Zhang', 'Karlson', 'Lee', 'Numan', 'Musa']

for i in range(len(first_names)):
    print(first_names[i], last_names[-i])
```

[B]

```
mylist = [
    [1,2,3,4,5],
    [6,7,8],
    [9,10,11,12,13,14],
    [15,16]
]

for sublist in mylist:
    if len(sublist) % 3 == 0:
        for x in sublist:
            print(x, end=' ')
        print()
    elif len(sublist) % 2 == 0:
        for i in range(len(sublist)-1, -1, -1):
            print(sublist[i], end=' ')
        print()
    else:
        print(len(sublist))
```