Lists, Day 1 Lab

How to get items from the keyboard into a list:

```
lst = []
num = int(input("Enter number: "))
while num != -1:
   lst.append(num)
   num = int(input("Enter number: "))

----------------------OR--------------------

lst = []
while True:
   num = int(input("Enter number: "))
   if num == -1:
     break
   lst.append(num)

# Other ways are possible, too.
```

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(1) Write a program to allow the user to input integers from the keyboard until they type -1. As each integer is entered, store them in a list.

(2) **After the input loop**, write a loop to calculate and print the sum of all the numbers in the list.

(3) **After the input loop**, write code to find & print the largest and smallest values in the list.

(4) Create a file with at least 10 integers in it, one per line. Call this file numbers.txt.
Change the input loop in your code to read the integers from the file instead, rather than from the keyboard.

(5) **After the input loop**, write code to print out the sum of every adjacent pair of numbers in the list (don't use sliding window; use indices)

(6) Change the input loop so the numbers are not read from a file, but are generated at random (say, between 1 and 100). In other words, write a loop to generate 20 random numbers, each between 1 and 100, and store them in a list.

(7) Hard: Write a loop to find the smallest number in your list of 20 random numbers. After the loop is done, add some code to exchange that smallest number with whatever number is in position [0] in the list (effectively putting the smallest item at the front of the list). Then write a loop to find the next-smallest item in the remaining 19 numbers, and move that item to position [1]. Keep repeating this idea until the list is completely sorted.

Lists, Day 2 Lab

Writing and testing functions that take lists as arguments:

Say we want to write a function that prints out all the numbers in a list greater than 10:

```
def greater10(lst):
  for pos in range(0, len(lst)):
    if lst[pos] > 10:
      print(lst[pos])
```

Test this function from the Python shell:

```
>>> mylist = [12, 8, 15, 14, 6]
>>> greater10(mylist)            # test with a list variable
12
15
14
>>> greater10([5, 10, 15, 20])   # test with a list literal
15
20
```

1. Write a function to find the largest integer in a list and print it out.

2. Write a function that takes a list of numbers and prints out sums of adjacent pairs of numbers in the list (don't use the sliding window; use indices).

3. Write a function that takes a list of strings and prints out all the strings that start and end with the same letter.

4. Write a function that takes a list of strings and prints out all the strings that have more a's than b's. Hint – try writing a separate function first to test if ONE string has more a's than b's.

5. Write a function that takes a list of strings and **RETURNS** a list of all the strings that have more a's than b's.

   Hint: make an empty list at the top of the function and append each string if it has more a's than b's.

6. Write a function that takes a list and shifts all the elements in the list one spot to the left, without using slices! (the left-most element disappears)
        So [1, 2, 3, 4, 5] turns into [2, 3, 4, 5, 5]

7. Can you make a function that shifts to the right?