In-Class - November 12 - SOLUTOINS

Please complete the following two programs in class and submit them online via NYU Classes before you leave. Make sure you submit them as separate .py files and include your name, the assignment, and the problem number in a comment at the top of the program.

1. Write a program that asks the user for their username and checks to see if it’s stored in "usernames.txt". If it’s not there, the program should add your username to the list in the file and alphabetize them. Make sure your program properly handles any IOError exceptions that are raised when the file is opened.

```python
# In-Class Assignment, November 12, #1

your_name = input("What is your username? ")
list_of_usernames = []

# Load list of usernames from file
try:
    infile = open('usernames.txt', 'r')
    line = infile.readline()
    line = line.rstrip('
')
    while line != ' ':
        list_of_usernames.append(line)
        line = infile.readline()
        line = line.rstrip('
')
    infile.close()
except IOError:
    print("Could not find the file usernames.txt.")

# Add username to list and sort
if not (your_name in list_of_usernames):
    list_of_usernames.append(your_name)
list_of_usernames.sort()

# Write updated list of usernames to file
outfile = open('usernames.txt', 'w')
for name in list_of_usernames:
    name += '
'
    outfile.write(name)
outfile.close()
print("Updated list of usernames written to file.")
```
2. Write a function `bubble_sort` that takes a list as an argument, sorts the list using *bubble sort*, and returns the sorted list. Recall that bubble sort works as follows:

1. Loop through the first \( n - 1 \) adjacent pairs in the list.
2. For each pair, swap their positions if they are in the wrong order.
3. The final item in the list should now be the maximum and is considered sorted. Repeat this process for the remaining unsorted items in the list.

For example, the diagram on the back demonstrates bubble sort being used to sort the list [6, 1, 2, 3, 4, 5].

```python
# In-Class Assignment, November 12, #2
def bubble_sort(some_list):
    length = len(some_list) - 1
    for i in range(length, 0, -1):
        for j in range(i):
            if some_list[j] > some_list[j + 1]:
                temp = some_list[j]  # temporarily store value in position j - 1
                some_list[j] = some_list[j + 1]
                some_list[j + 1] = temp
    return some_list

example_list = [6, 1, 2, 3, 4, 5]
print("This program bubble sorts the list", example_list)
sorted_list = bubble_sort(example_list)
print("The sorted list is", sorted_list)
```
Unsorted

6 > 1, swap
6 > 2, swap
6 > 3, swap
6 > 4, swap
6 > 5, swap

1 < 2, ok
2 < 3, ok
3 < 4, ok
4 < 5, ok

Sorted