Homework assignment on 1-D Array

EEE Section C2

Submission date: 18/5/15 Next Lab

There are 6 problems. You must try hard to solve each problem. Only one of your solutions will be checked (it could be any one) and given marks based on that. You will enjoy negative marks if you copy code from your classmates.

Problem 1.

Take N integers as input and print them in sorted order from lowest to highest using **Bubble Sort**.

Input	Output
6 -2 10 0 2 5 -9	-9 -2 0 2 5 10

Bubble Sort: Step-by-step example

Let us take the array of numbers "5 1 4 2 8", and sort the array from lowest number to greatest number using bubble sort. In each step, elements written in **bold** are being compared. Three passes will be required.

First Pass:
(**5 1** 4 2 8) → (**1 5** 4 2 8), Here, algorithm compares the first two elements, and swaps since 5>1.
(1 **5 4** 2 8) → (1 **4 5** 2 8), Swap since 5 > 4
(1 4 **5 2** 8) → (1 4 **2 5** 8), Swap since 5 > 2
(1 4 2 **5 8**) → (1 4 2 **5 8**), Now, since these elements are already in order (8 > 5), algorithm does not swap them.
Second Pass:
(**1 4** 2 5 8) → (**1 4** 2 5 8)
(1 **4 2** 5 8) → (1 **2 4** 5 8), Swap since 4 > 2
(1 2 **4 5** 8) → (1 2 **4 5** 8)
(1 2 4 **5 8**) → (1 2 4 **5 8**)
Now, the array is already sorted, but the algorithm does not know if it is completed. The algorithm needs one **whole** pass without **any** swap to know it is sorted.
Third Pass:
(**1 2** 4 5 8) → (**1 2** 4 5 8)
(1 **2 4** 5 8) → (1 **2 4** 5 8)
(1 2 **4 5** 8) → (1 2 **4 5** 8)
(1 2 4 **5 8**) → (1 2 4 **5 8**)

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Problem 2.

Input:

1. Integer N which is the total number of integers
2. N integers
3. Integer S, E which are the starting and ending position. The range of S and E is 0 to N-1.

Output:

Print the numbers in such a way that only the numbers between S and E are in sorted order. The other numbers should be in their original position.

Input	**Output**
8 -2 10 0 2 5 -9 7 8 2 5	-2 10 -9 0 2 5 7 8

Problem 3.

Read the entries of an array of N integers from a user. Compute X as the average of the 10 entries and then compute the average of those entries that are greater than or equal to X. Print this final average.

Input	**Output**
8 4 6 10 15 8 7 3 20	15

Explanation: Here average of these 8 numbers is 9.125. 10, 15 and 20 are greater than or equal to 9.125. Average of 10, 15 and 20 is 15.

Problem 4.

In this problem, you are given N integers in sorted order. The sort order may be ascending or descending. This is not known. Your job is to print out the unique integers in the array.

Input	**Output**
8 4 5 5 5 6 7 7 10 25 25	4 6 10

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Problem 5.

Read the entries of an array of N integers from a user and read another integer M. You have to show the positions of M in the array of N items.

Input	**Output**
10 4 5 3 5 6 7 5 10 5 25 5	1, 3, 6, 8,
10 4 5 3 5 6 7 5 10 5 25 15	Not found

Problem 6.

Read the entries of an array of N integers from a user. You have to print the sequence of integers whose sum is maximum.

Input	**Output**
6 -2 1 3 5 -6 2	1 3 5
7 -2 -5 -6 -4 -12 -45 -30	-2