Sorting: Bubble Sort

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Consider the following version of Bubble Sort:

```
for (int i = 0; i < n; i++) {

    for (int j = 0; j < n - 1; j++) {
        // Swap adjacent elements if they are in decreasing order
        if (a[j] > a[j + 1]) {
            swap(a[j], a[j + 1]);
        }
    }

}
```

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Difficulty	Easy
Max Score	30
Submitted By	123777

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RESOURCES

Given an array of integers, sort the array in ascending order using the Bubble Sort algorithm above. Once sorted, print the following three lines:

1. `Array is sorted in numSwaps swaps.`, where $numSwaps$ is the number of swaps that took place.
2. `First Element: firstElement`, where $firstElement$ is the first element in the sorted array.
3. `Last Element: lastElement`, where $lastElement$ is the last element in the sorted array.

Hint: To complete this challenge, you must add a variable that keeps a running tally of all swaps that occur during execution.

For example, given a worst-case but small array to sort: $a = [6, 4, 1]$ we go through the following steps:

```
swap    a
0       [6,4,1]
1       [4,6,1]
2       [4,1,6]
3       [1,4,6]
```

It took 3 swaps to sort the array. Output would be

```
Array is sorted in 3 swaps.
First Element: 1
Last Element: 6
```

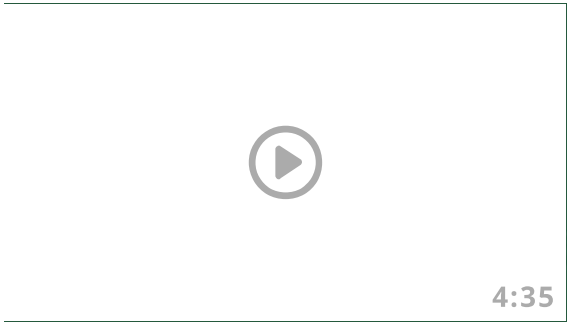
Function Description

Complete the function countSwaps in the editor below. It should print the three lines required, then return.

countSwaps has the following parameter(s):

- a: an array of integers .

Input Format



Bubble Sort

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MORE DETAILS

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Suggest Edits

The first line contains an integer, n, the size of the array a.

The second line contains n space-separated integers $a[i]$.

Constraints

- $2 \leq n \leq 600$
- $1 \leq a[i] \leq 2 \times 10^6$

Output Format

You must print the following three lines of output:

1. `Array is sorted in numSwaps swaps.`, where $numSwaps$ is the number of swaps that took place.
2. `First Element: firstElement`, where $firstElement$ is the first element in the sorted array.
3. `Last Element: lastElement`, where $lastElement$ is the last element in the sorted array.

Sample Input 0

```
3
1 2 3
```

Sample Output 0

```
Array is sorted in 0 swaps.
First Element: 1
Last Element: 3
```

Explanation 0

The array is already sorted, so 0 swaps take place and we print the necessary three lines of output shown above.

Sample Input 1

```
3
3 2 1
```

Sample Output 1

```
Array is sorted in 3 swaps.
First Element: 1
Last Element: 3
```

Explanation 1

The array is not sorted, and its initial values are: $\{3, 2, 1\}$. The following 3 swaps take place:

1. $\{3, 2, 1\} \rightarrow \{2, 3, 1\}$
2. $\{2, 3, 1\} \rightarrow \{2, 1, 3\}$
3. $\{2, 1, 3\} \rightarrow \{1, 2, 3\}$

At this point the array is sorted and we print the necessary three lines of output shown above.

Change Theme Python 3

```
1
2  def countSwaps():
3      cs=0
4      for i in range(n):
5          for j in range(n-1):
6              if(a[j]>a[j+1]):
```

```
                cs+=1
                a[j],a[j+1]=a[j+1],a[j]
    print("Array is sorted in "+str(cs)+" swaps.")
    print("First Element: "+str(a[0]))
    print("Last Element: "+str(a[n-1]))
n=int(input())
a = list(map(int, input().rstrip().split()))
countSwaps()

```

Line: 15 Col: 1

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Congratulations

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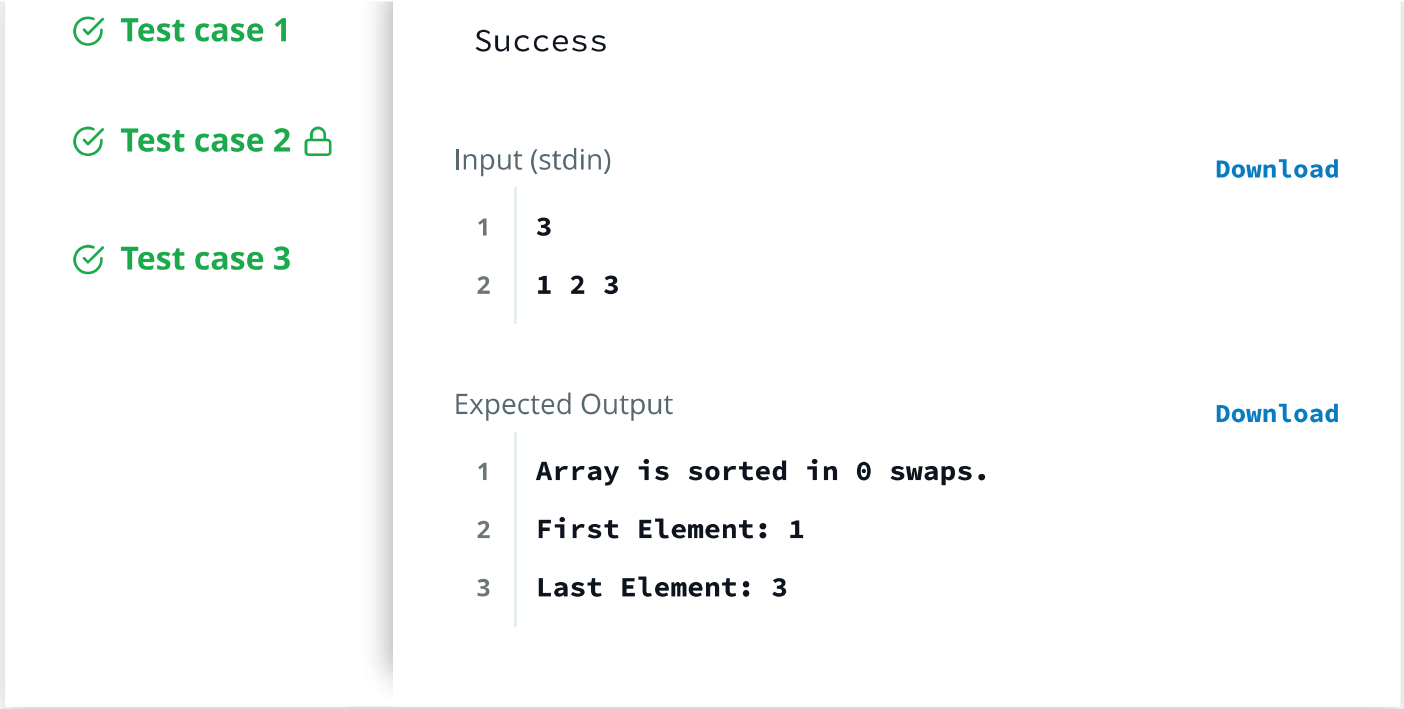
Next Challenge

Test case 0

Compiler Message


Test case 1
Test case 2
Test case 3
Success
Input (stdin)
Download
3
1 2 3
Expected Output
Download
Array is sorted in 0 swaps.
First Element: 1
Last Element: 3