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Day 20: Sorting

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Problem Submissions Leaderboard Discussions Editorial Tutorial

Objective

Today, we're discussing a simple sorting algorithm called *Bubble Sort*. Check out the Tutorial tab for learning materials and an instructional video!

Consider the following version of Bubble Sort:

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

    for (int j = 0; j < n - 1; j++) {
        if (a[j] > a[j + 1]) {
            swap(a[j], a[j + 1]);
            numberOfSwaps++;
        }
    }

    if (numberOfSwaps == 0) {
        break;
    }
}
```

Task

Given an array, a, of size n containing distinct elements $a[0], a[1], \ldots, a[n-1]$, sort array a in ascending order using the *Bubble Sort* algorithm above. Once sorted, print the following **3** 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 will need to add a variable that keeps a running tally of *all* swaps that occur during execution.

Input Format

The first line contains an integer, n, denoting the number of elements in array a.
The second line contains n space-separated integers describing a, where the i^{th} integer is $a[i]$, $\forall\, i \in [0,\ n-1]$.

Constraints

- $2 \leq n \leq 600$
- $1 \leq a[i] \leq 2 \times 10^6$, $\forall\, i \in [0,\ n-1]$

Output Format

There should be 3 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
```

Sample Input 1

```
3
3 2 1
```

Sample Output 1

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

Explanation

Sample Case 1:
The array is already sorted, so 0 swaps take place and we print the necessary 3 lines of output shown above.

Sample Case 2:
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 3 lines of output shown above.

Submissions: 5268
Max Score: 30
Difficulty: Easy

More

Current Buffer (saved locally, editable) Python 2

```
#!/bin/python

import sys


n = int(raw_input().strip())
```

```
a = map(int,raw_input().strip().split(' '))
numSwaps=0
for i in range(n):
    for j in range(n-1):
        if a[j]>a[j+1]:
            temp=a[j+1]
            a[j+1]=a[j]
            a[j]=temp
            numSwaps=numSwaps+1
    #if numSwaps==0:
    #    break
print 'Array is sorted in %i swaps.' %numSwaps
print 'First Element:',a[0]
print 'Last Element:', a[len(a)-1]
```

Line: 9 Col: 19

Upload Code as File Test against custom input Run Code Submit Code

Congrats, you solved this challenge!

✔ Test Case #0 ✔ Test Case #1 ✔ Test Case #2

Next Challenge