

## 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++) {  
    // Track number of elements swapped during a  
    int numberOfSwaps = 0;  
  
    for (int j = 0; j < n - 1; j++) {  
        // Swap adjacent elements if they  
        if (a[j] > a[j + 1]) {  
            swap(a[j], a[j + 1]);  
            numberOfSwaps++;  
        }  
    }  
  
    // If no elements were swapped during  
    if (numberOfSwaps == 0) {  
        break;  
    }  
}
```

## Task

Given an array, **a**, of size **n** distinct elements, sort the array 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.

## Example

**a** = [4, 3, 1, 2]

```
original a: 4 3 1 2  
round 1 a: 3 1 2 4 swaps this round: 3  
round 2 a: 1 2 3 4 swaps this round: 2  
round 3 a: 1 2 3 4 swaps this round: 0
```

In the first round, the **4** is swapped at each of the **3** comparisons, ending in the last position. In the second round, the **3** is swapped at **2** of the **3** comparisons. Finally, in the third round, no swaps are made so the iterations stop. The output is the following:

```
Array is sorted in 5 swaps.  
First Element: 1  
Last Element: 4
```

## Input Format

[Change Theme](#)

Java 8



```
// public class solution {  
8  
9     public static void main(String[] args) {  
10         Scanner in = new Scanner(System.in);  
11         int n = in.nextInt();  
12         int[] a = new int[n];  
13         for(int a_i=0; a_i < n; a_i++){  
14             a[a_i] = in.nextInt();  
15         }  
16         // Write Your Code Here  
17         int numberOfSwaps = 0;  
18         for (int i = 0; i < n; i++) {  
19  
20             for (int j = 0; j < n - 1 ; j++) {  
21                 if (a[j] > a[j + 1]) {  
22                     int previousItem = a[j + 1];  
23                     a[j + 1] = a[j];  
24                     a[j] = previousItem;  
25                     numberOfSwaps++;  
26                 }  
27             }  
28         }  
29  
30         System.out.println("Array is sorted in " +  
31                             numberOfSwaps + " swaps." +  
32                             "\nFirst Element: " + a[0] +  
33                             "\nLast Element: " + a[n - 1]);  
34     }  
}
```

Line: 31 Col: 24

⬆ Upload Code as File  
☐ Test against custom input

Run Code

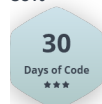
Submit Code

You have earned 30.00 points!

You are now 1 challenge away from the 4th star for your 30 days of code badge.

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## Congratulations

You solved this challenge. Would you like to challenge your friends?

[Next Challenge](#)☒ Test case 0☒ Test case 1☒ Test case 2 

Compiler Message

Success

Input (stdin)

[Download](#)

```
1 3  
2 1 2 3
```

Expected Output

[Download](#)

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



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```
for (int i = 0; i < n; i++) {  
    // Track number of elements swapped during a bubble  
    int numberOfSwaps = 0;  
  
    for (int j = 0; j < n - 1; j++) {  
        // Swap adjacent elements if they  
        if (a[j] > a[j + 1]) {  
            swap(a[j], a[j + 1]);  
            numberOfSwaps++;  
        }  
    }  
  
    // If no elements were swapped during  
    if (numberOfSwaps == 0) {  
        break;  
    }  
}
```

## Task

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14             a[a_i] = in.nextInt();  
15         }  
16         // Write Your Code Here  
17         int numberOfSwaps = 0;  
18         for (int i = 0; i < n; i++) {  
19  
20             for (int j = 0; j < n - 1 ; j++) {  
21                 if (a[j] > a[j + 1]) {  
22                     int previousItem = a[j + 1];  
23                     a[j + 1] = a[j];  
24                     a[j] = previousItem;  
25                     numberOfSwaps++;  
26                 }  
27             }  
28         }  
29  
30         System.out.println("Array is sorted in " +  
31                             numberOfSwaps + " swaps." +  
32                             "\nFirst Element: " + a[0] +  
33                             "\nLast Element: " + a[n - 1]);  
34     }  
}
```

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30

Days of Code

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Next Challenge

Test case 0

Test case 1

Test case 2

Compiler Message

Success

Input (stdin)

Download

```
1 | 3  
2 | 1 2 3
```

Expected Output

Download

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

