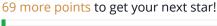


HackerRank





Insertion Sort - Part 1 🌣



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Your Insertion Sort - Part 1 submission got 30.00 points.

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Problem

Submissions

Leaderboard

Sorting

One common task for computers is to sort data. For example, people might want to see all their files on a computer sorted by size. Since sorting is a simple problem with many different possible solutions, it is often used to introduce the study of algorithms.

Insertion Sort

These challenges will cover Insertion Sort, a simple and intuitive sorting algorithm. We will first start with a nearly sorted list.

Insert element into sorted list

Given a sorted list with an unsorted number e in the rightmost cell, can you write some simple code to insert e into the array so that it remains sorted?

Since this is a learning exercise, it won't be the most efficient way of performing the insertion. It will instead demonstrate the brute-force method in detail.

Assume you are given the array arr = [1, 2, 4, 5, 3] indexed $0 \dots 4$. Store the value of arr[4]. Now test lower index values successively from 3 to 0 until you reach a value that is lower than arr[4], at arr[1] in this case. Each time your test fails, copy the value at the lower index to the current index and print your array. When the next lower indexed value is smaller than arr[4], insert the stored value at the current index and print the entire array.

Example

$$n = 5$$

$$arr = [1, 2, 4, 5, 3]$$

Start at the rightmost index. Store the value of arr[4] = 3. Compare this to each element to the left until a smaller value is reached. Here are the results as described:

1 2 4 5 5

1 2 4 4 5

1 2 3 4 5

Function Description

Complete the insertionSort1 function in the editor below.

insertionSort1 has the following parameter(s):

- n: an integer, the size of *arr*
- arr: an array of integers to sort

Returns

• None: Print the interim and final arrays, each on a new line. No return value is expected.

Input Format

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

The next line contains n space-separated integers $arr[0] \dots arr[n-1]$.

Constraints

$$1 \le n \le 1000$$

$$-10000 \leq arr[i] \leq 10000$$

Output Format

Print the array as a row of space-separated integers each time there is a shift or insertion.

Sample Input



```
1/24/2021
                                                                           Insertion Sort - Part 1 | HackerRank
      5
      2 4 6 8 3
   Sample Output
      2 4 6 8 8
      2 4 6 6 8
      2 4 4 6 8
      2 3 4 6 8
```

Explanation

3 is removed from the end of the array.

In the 1^{st} line 8 > 3, so 8 is shifted one cell to the right.

In the 2^{nd} line 6 > 3, so 6 is shifted one cell to the right.

In the 3^{rd} line 4 > 3, so 4 is shifted one cell to the right.

In the $\mathbf{4}^{\text{th}}$ line $\mathbf{2} < \mathbf{3}$, so $\mathbf{3}$ is placed at position $\mathbf{1}$.

Next Challenge

In the next Challenge, we will complete the insertion sort.

```
Change Theme
                                                                                 C++
    //function to display the array
    void display(vector<int> arr, int n)
        for(int i=0; i<n; i++)
11 🗸
            cout<<arr[i]<<" ";
```

```
<del>1</del>3
         cout<<"\n";
     }
17
     // Complete the insertionSort1 function below.
     void insertionSort1(int n, vector<int> arr) {
     int j=n-2;
     int key= arr[n-1];
     while( j>=0 && key<arr[j])</pre>
24 \( \{ \)
         //shift the element towards right
         arr[j+1] = arr[j];
         //calling the function display
27
         display(arr, n);
         j--;
                                                                                                               Line: 8 Col: 37
```

☐ Test against custom input **1** Upload Code as File

Run Code

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1%

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Congratulations

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Next Challenge



```
⊘ Test case 0
                       Compiler Message
                        Success
⊘ Test case 1 △
⊘ Test case 2 △
                       Input (stdin)
                                                                                                    Download
                       1 5
⊘ Test case 3 △
                       2 2 4 6 8 3
                       Expected Output
                                                                                                    Download
                           2 4 6 8 8
                          2 4 6 6 8
                           2 4 4 6 8
                          2 3 4 6 8
```

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