Java Basics – Algorithms

The goal of this lab is to practice **creation of algorithms**. Your task is to write your interpretation of the algorithm (without rewriting the entire code).

Problem 3. Insertion Sort

Write a sorting algorithm of type **Insertion sort**. It should iterate through a list of integers and sort them. The way insertion sort algorithm works is:

- Mark the first element as sorted.
- Remove the current element from the list.
- Start iterating to the left to find which position is suitable for the current element. A suitable position is considered a place where the element to the left is no longer bigger than the current element.

More information about the insertion sorting algorithm could be found here.

After you get the expected output, uncomment the comments in the pseudo code to see how long does it take for your algorithm to execute. Test it with a lot of elements to see the difference.

Output

You should print out the sorted list in the format described below.

Constraints

- The input list will hold integers in the range [−2147483648 … 2147483647].
- The size of the list could be [10…50000].
- There could be elements in the list that hold the same values.
- **You are forbidden to use .sort() methods**

Tests

Input	Expected Output
[22, 37, 39, 89, 38, 21, 34, 61, 67, 73, 70, 29, 34, 84, 76, 87, 9, 56, 61, 61, 74, 52, 93, 74, 47, 13, 6, 82, 32, 43, 40, 68, 88, 67, 40, 34, 88, 53, 2, 82, 74, 44, 4, 96, 3, 43, 98, 68, 24, 90, 52, 97, 93, 61, 73, 71, 97, 8, 57, 57, 81, 93, 92, 8, 93, 77, 94, 56, 48, 60, 12, 1, 11, 21, 45, 78, 80, 51, 9, 33, 49, 47, 98, 0, 62, 83, 93, 40, 38, 29, 76, 6, 35, 68, 90, 36, 0, 55, 95, 72, 15, 3, 2, 85, 31, 17, 10, 32, 78, 35, 44, 25, 7, 80, 16, 12, 12, 9, 42, 68, 0, 77, 68, 62, 8, 72, 22, 20, 80, 96, 17, 72, 24, 62, 19, 89, 93, 49, 46, 45, 39, 80, 56, 16, 59, 17, 39, 74, 90, 19, 0, 12, 69, 5, 55, 36, 76, 61, 29, 64, 77, 9, 60, 57, 84, 16, 34, 1, 71, 59, 97, 25, 42, 25, 63, 27, 53, 37, 57, 78, 26, 36, 98, 14, 61, 17, 90, 37, 57, 41, 89, 45, 60, 25, 70, 56, 77, 7, 77, 62]	[0, 0, 0, 0, 1, 1, 2, 2, 3, 3, 4, 5, 6, 6, 7, 7, 8, 8, 8, 9, 9, 9, 9, 10, 11, 12, 12, 12, 12, 13, 14, 15, 16, 16, 16, 17, 17, 17, 17, 19, 19, 20, 21, 21, 22, 22, 24, 24, 25, 25, 25, 25, 26, 27, 29, 29, 29, 31, 32, 32, 33, 34, 34, 34, 34, 35, 35, 36, 36, 36, 37, 37, 37, 38, 38, 39, 39, 39, 40, 40, 40, 41, 42, 42, 43, 43, 44, 44, 45, 45, 45, 46, 47, 47, 48, 49, 49, 51, 52, 52, 53, 53, 55, 55, 56, 56, 56, 56, 57, 57, 57, 57, 57, 59, 59, 60, 60, 60, 61, 61, 61, 61, 61, 61, 62, 62, 62, 62, 63, 64, 67, 67, 68, 68, 68, 68, 68, 69, 70, 70, 71, 71, 72, 72, 72, 73, 73, 74, 74, 74, 74, 76, 76, 76, 77, 77, 77, 77, 77, 78, 78, 78, 80, 80, 80, 80, 81, 82, 82, 83, 84, 84, 85, 87, 88, 88, 89, 89, 89, 90, 90, 90, 90, 92, 93, 93, 93, 93, 93, 93, 94, 95, 96, 96, 97, 97, 97, 98, 98, 98]