# C# Advanced Lab - Algorithms

This document defines **algorithmic problems** from the ["Advanced C#" Course @ Software University](http://softuni.bg/courses/advanced-csharp/). You are presented with some problems and certain steps you need to take in order to accomplish the tasks.

## Insertion Sort

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| **Insertion Sort Algorithm** |
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| You can see an **animated** version of the algorithm in detail here: [*http://upload.wikimedia.org/wikipedia/commons/0/0f/Insertion-sort-example-300px.gif*](http://upload.wikimedia.org/wikipedia/commons/0/0f/Insertion-sort-example-300px.gif) |

Your task is to implement the [Insertion Sort](http://en.wikipedia.org/wiki/Insertion_sort) algorithm using C#. The solution of the algorithm is as follows:

* Start from **i =** **1** and iterate to the **last element**
  + If **A[i-1]** is **larger** than **A[i]**:
    - Start shifting all previous elements (**i-1**, **i-2**, **i-3**, etc.) **larger** than the **A[i]** to the right
    - Do the above until **A[i-n]** is smaller or equal to **A[i]**

### Constraints

* The input list will hold integers in the range [−2147483648 … 2147483647].
* You are **NOT allowed** to use **Array.Sort()**, **.OrderBy()** or similar methods. Write **your own** Insertion Sort algorithm.

### Example

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| **Input** | **Output** |
| 5 1 19 12 3 6 10 2 | 1 2 3 5 6 10 12 19 |
| 0 1 2 3 4 5 6 6 7 8 | 0 1 2 3 4 5 6 6 7 8 |
| 0 -1 0 -1 -1 0 -2 3 -1 -3 5 -1 | -3 -2 -1 -1 -1 -1 -1 0 0 0 3 5 |