Counting Sort (Time Complexity)

best, average and worst case time complexity of the counting sort algorithm (Reading time: under 1 minute)

	TIME		SPACE
Best	**Average**	**Worst**	**Worst**
O(n + k)	O(n + k)	O(n + k)	O(k)

Best, average and worst:

As we have three separate for loops, the time it takes for the entire function to run is dependent on the individual loops. If the first for-loop has *linear* complexity, i.e., **O(n)**, and the second for loop also has *linear* complexity, i.e.,**O(k)**, where **k** is the difference between the highest and lowest value in the array we want to sort. We add them together, which makes **O(n** + **k)**.

Worst space:

The length of the count array grows with the same amount as the size of the input.

Now, let's move on to the Bucket sort algorithm in the next lesson.