BMI203: HW1

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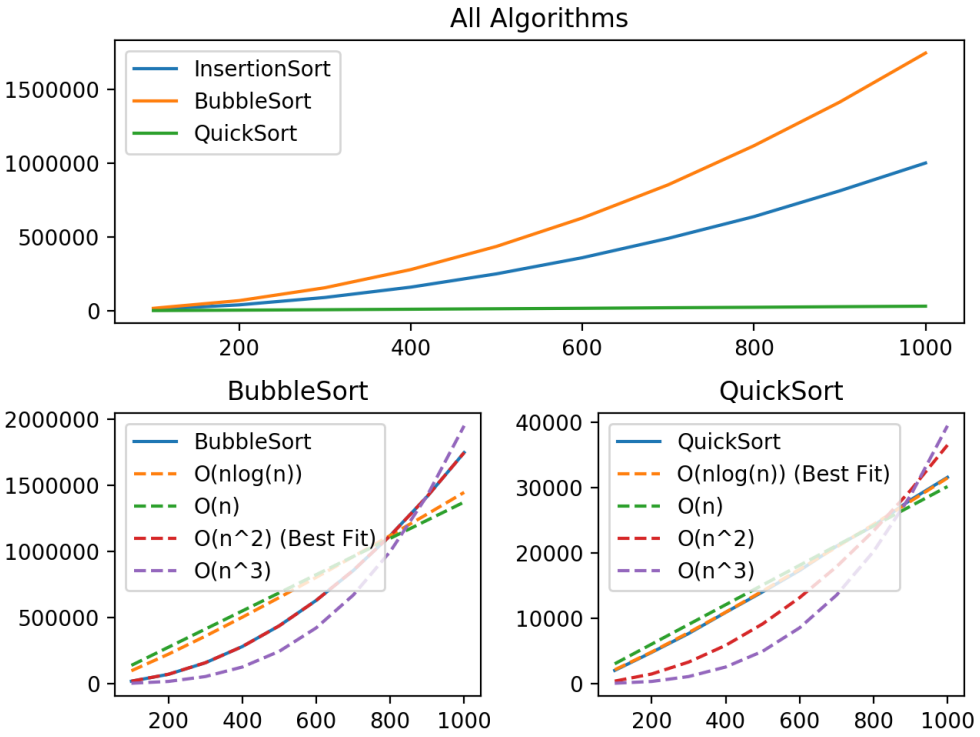
	Assignments	Conditionals
BubbleSort	79	52
InsertionSort	60	81
Quicksort	51	33

Counts for the number of assignments and conditionals for a given run on a random 10 element array.



Bubble sort - The expected average complexity of bubblesort is $O(n^2)$. This is because each element in the array is compared and potentially switched with every other element, leading to n^2 operations. The nested loop in the implementation further proves this.

Quick sort - The expected average complexity of quicksort is $O(nlog(n))$. This is because the list is progressively broken down into two smaller lists. Each of these lists is then iterated through once while arranging values around the pivot, before being further divided into two smaller lists, and so on.

As an additional proof, the graph above shows the number of operations (assignments + conditionals) plotted against n, the number of elements in the array. BubbleSort grows much faster in relation to n than Quicksort. Fitting different lines to the curve for the individual algorithms and taking the curve with the lowest residual further demonstrates the relative complexities.

Github: `https://github.com/laurashub/BMI203HW1`.