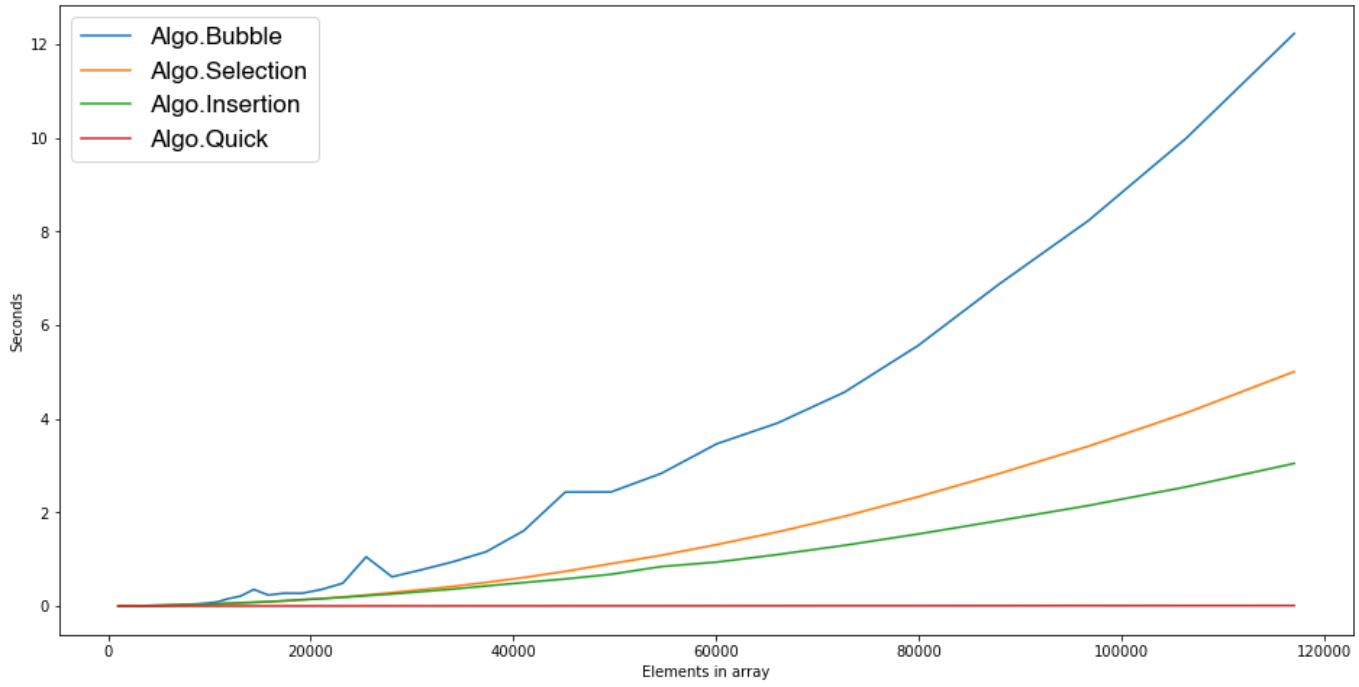
Big O and timing analysis of sorting algorithms

The time complexity of 4 differernt sorting algorithms is listed below along with a graph of the time it takes to sort an array as the number of elements in that array increases.

- Bubble Sort is $O(n^2)$ and this is a result of the nested for loop inside of the algorithm
- Selection Sort is $O(n^2)$ and is a result of for loops inside of a while loop but the perfomance of this algorithm is better than that of Bubble Sort.
- Insertion Sort is also $O(n^2)$ because of the nested for loops in the algorithm but this algorithm is more efficient than both Selection and Bubble Sort.
- QuickSort has a time complexity of $O(n * log\ n)$ and is much more efficient than the other sorting algorithms.



The average time to run each of these algorithms can be seen in the table below.

Algorithm	Average Time (s)
Bubble	1.429713
Selection	0.564492
Insertion	0.389414
Quick	0.002406