

1 Results

	Number of Comparisons	Asymptotic Running Time
Selection Sort	220780	$O(n^2)$
Insertion Sort	114121	$O(n^2)$
Merge Sort	5413	$O(n \cdot \log(n))$
Quick Sort	1836	$O(n \cdot \log(n))$

The asymptotic running times for both selection sort and insertion sort is $O(n^2)$. Both of these functions iterate through nested for loops which cause the Big Oh upper bound to be n^2 . On the other hand, merge sort and quick sort have asymptotic running times of $O(n \cdot \log(n))$. Instead of using for loops, these algorithms use recursion and break up the sorting into two steps: divide and conquer. The running time for dividing the array is $\log(n)$, and the running time for conquering the array until its sorted is n which makes up the $n \cdot \log(n)$. Also, the shuffle method is taking in a completely sorted array and it is randomly moving the elements around, so the number of comparisons is slightly less than expected.