

## Hypothesis

The following table shows the big-oh for insertion sort and shell sort algorithms for the generated data:

Sorting Algorithm	Insertion sort	Shell sort
Binary data	$O(N)$ (best case)	$O(N\log(N))$ (best case)
Half data	$O(N)$ (best case)	$O(N\log(N))$ (best case)
Half random data	$O(N^2)$ (average case)	Unknown (average case)

By looking at the data generated from the binary test data method and the Half test data method we can observe that the data is already sorted. Which makes it the best case scenario for both insertion sort and shell sort in terms of performance. However, for the Half random test data method the generated data is completely random since half the data are positive and negative numbers generated randomly and the other half is zeros which makes it the average case for both sorting algorithms