(Q1)

Insertion sort

```
total elements in array: 500
Time taken is 0 milliseconds

total elements in array: 1000
Time taken is 0 milliseconds

total elements in array: 6000
Time taken is 31 milliseconds

total elements in array: 10000
Time taken is 85 milliseconds

total elements in array: 20000
Time taken is 343 milliseconds
```

Bubble sort

```
total elements in array: 500
Time taken is 0 milliseconds

total elements in array: 1000
Time taken is 2 milliseconds

total elements in array: 6000
Time taken is 126 milliseconds

total elements in array: 10000
Time taken is 373 milliseconds

total elements in array: 20000
Time taken is 2733 milliseconds
```

Optimized Bubble sort

```
total elements in array: 500
Time taken is 0 milliseconds

total elements in array: 1000
Time taken is 2 milliseconds

total elements in array: 6000
Time taken is 188 milliseconds

total elements in array: 10000
Time taken is 349 milliseconds

total elements in array: 20000
Time taken is 1568 milliseconds
```

Selection sort

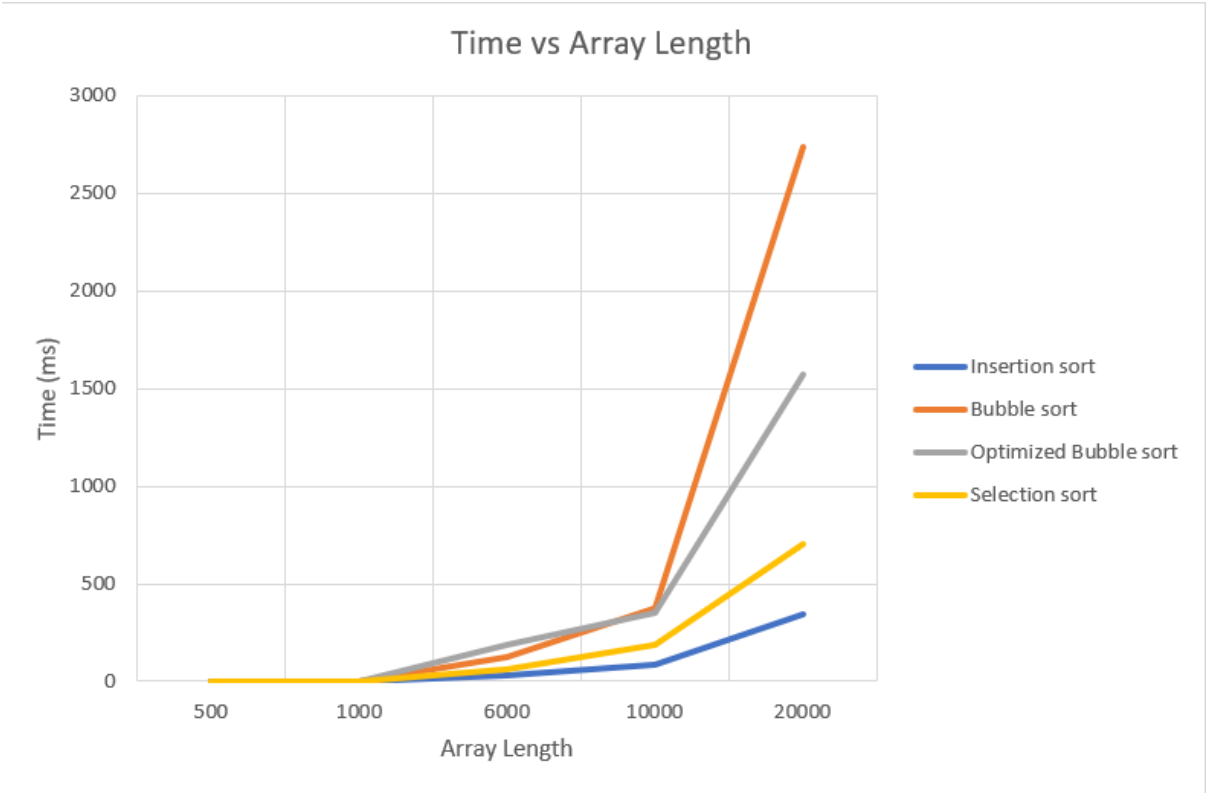
```
total elements in array: 500
Time taken is 0 milliseconds

total elements in array: 1000
Time taken is 2 milliseconds

total elements in array: 6000
Time taken is 61 milliseconds

total elements in array: 10000
Time taken is 185 milliseconds

total elements in array: 20000
Time taken is 704 milliseconds
```



Insertion sort seems to be the fastest way for sorting even at very high lengths.

Second place goes to selection sort, while optimized bubble sort is the third pace where bubble sort seems to be the slowest.

At lover lengths (less than 1000) all sorting algorithms have only take small times which is less than 1ms.