

CS2023 - Data Structures and Algorithms In-class Lab Exercise 03

INDEX:210400N

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Insertion Sort:

Total elements in the array :500

Time taken is: 0.000484 seconds.

Total elements in the array :5000

Time taken is: 0.031200 seconds.

Total elements in the array :10000

Time taken is: 0.107874 seconds.

Total elements in the array :15000

Time taken is: 0.257088 seconds.

Total elements in the array :20000

Time taken is: 0.417766 seconds.

Bubble sort:

Total elements in the array :500

Time taken is: 0.001201 seconds.

Total elements in the array :5000

Time taken is: 0.087734 seconds.

Total elements in the array :10000

Time taken is: 0.372850 seconds.

Total elements in the array :15000

Time taken is: 0.856300 seconds.

Total elements in the array :20000

Time taken is: 1.526549 seconds.

Optimised bubble sort :

Total elements in the array :500

Time taken is: 0.001026 seconds.

Total elements in the array :5000

Time taken is: 0.085032 seconds.

Total elements in the array :10000

Time taken is: 0.367947 seconds.

Total elements in the array :15000

Time taken is: 0.837966 seconds.

Total elements in the array :20000

Time taken is: 1.506183 seconds.

Selection sort:

Total elements in the array :500

Time taken is: 0.000767 seconds.

Total elements in the array :5000

Time taken is: 0.035718 seconds.

Total elements in the array :10000

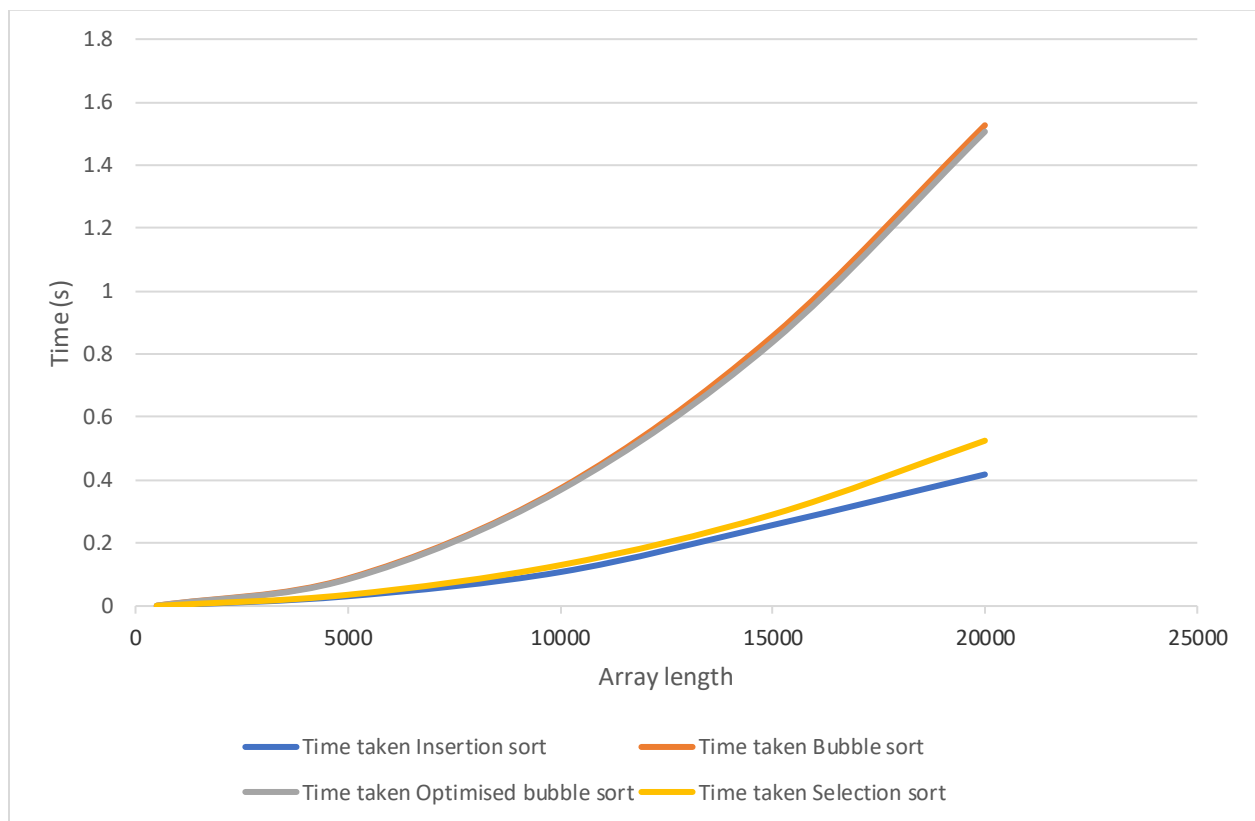
Time taken is: 0.129906 seconds.

Total elements in the array :15000

Time taken is: 0.290412 seconds.

Total elements in the array :20000

Time taken is: 0.525064 seconds.



Complexity of each sorting algorithms According to the graph

Insertion sort : $\Theta(N^2)$

Bubble sort : $\Theta(N^2)$

Optimized bubble sort : $\Theta(N^2)$

Selection sort : $\Theta(N^2)$