Exerecise 1 report

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1 Report

This brief summary presents the results obtained from the tests conducted on the algorithm implemented in Exercise 1.

To carry out these tests, the algotihm has been executed 10 times for each combination of the parameter k and field. To generate graph-ready values, the arithmetic mean was calculated for each set of results. Subsequently, these means for each field were plotted against the corresponding values of k, as illustrated in Figure 1.
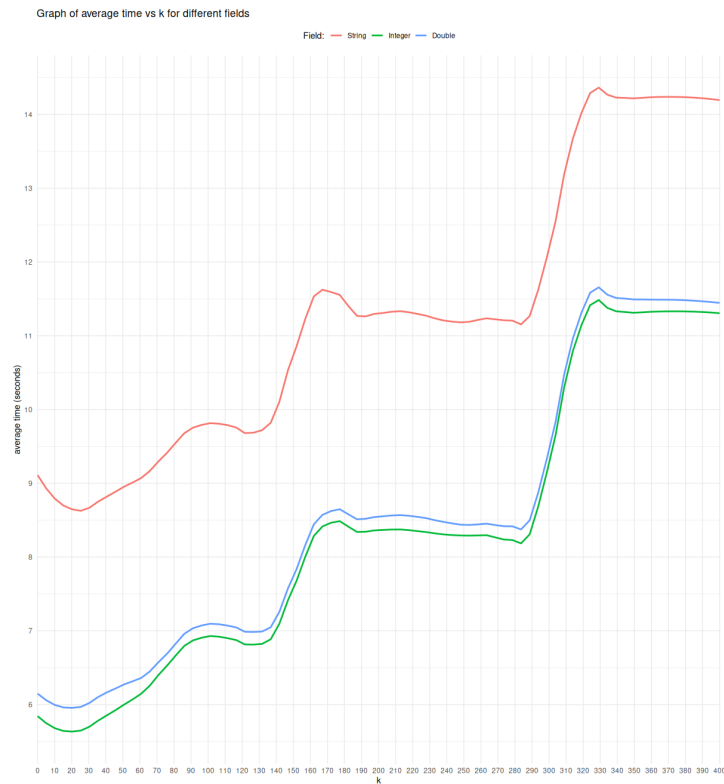

Figure 1: Graph showing the results obtained in the tests

Upon analyzing the trends in the graph, it is possible to notice that the minumum time archieved for sorting the records is obtained when k falls within the range of approximately 20 to 30.

The sorting process involves using the Binary Insertion Sort algorithm for sub-arrays with a length $\leq$ k and the Merge Sort algorithm for larger sub-arrays. Consequently, optimal performance was anticipated for smaller values of k. This can be explained by considering that Binary Insertion Sort is particularly efficient for short arrays, and its advantage becomes more pronounced when sorting sub-arrays with fewer elements. On the other hand, Merge Sort, while efficient for larger arrays, incurs a higher overhead for smaller sub-arrays due to its divide-and-conquer nature.