Analysis Lab2: HG Assignment 2 and 3

Tom K. Axberg

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All tests is done with integers [0,255] and every test with length N has been done 10 times.

HG Assignment 2 Assignment states: Compare the execution times for sorting large arrays of integers with quicksort and merge sort. When should one select quicksort over mergesort?

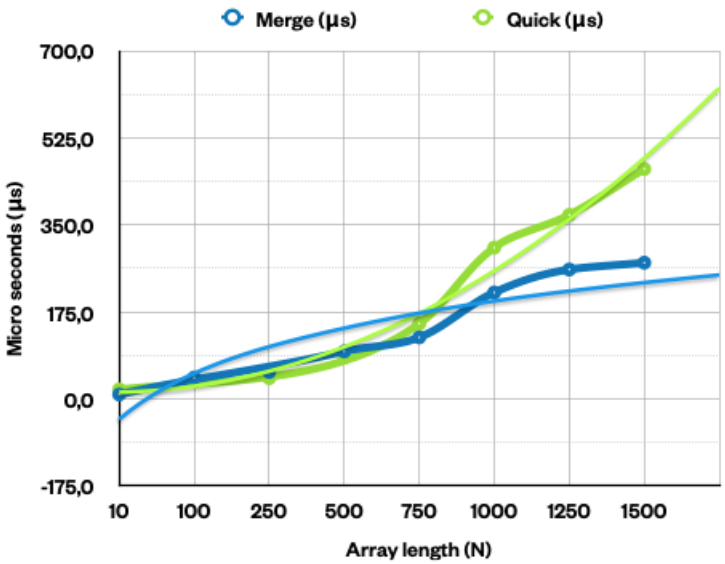
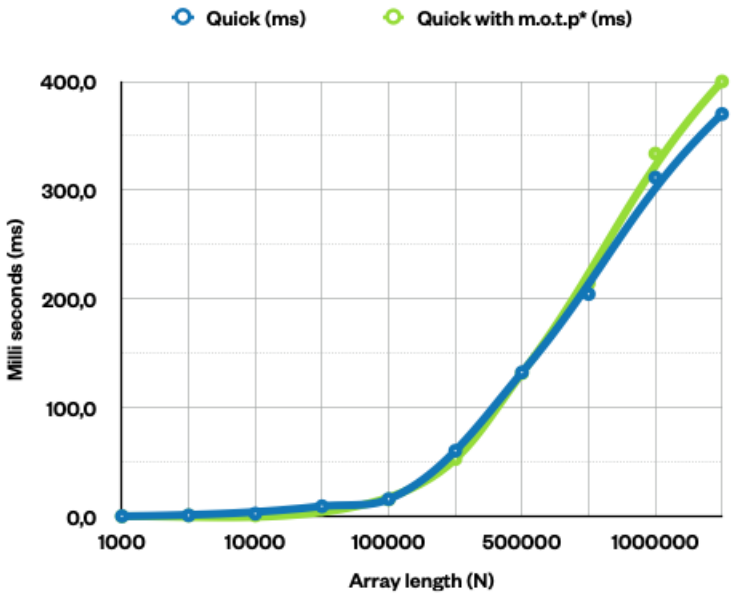


Figure 1

If we look at figure 1 we can see that Quicksort is a better choose for N smaller than around 600. Worst case complexity of quick sort is O(n2) whereas merge sort, worst case and average case has same complexities O(n log n). If we look at the trend lines we could see the complexity clearly with a crossing at around 760, which is not far away from the 600.

HG Assignment 3 Assignment states: Compare the execution times of quicksort where the first element in each sub-array is selected as partitioning element to that of quicksort with median-of-three partitioning.



**Median of three partition*
Figure 2

If we look at figure 2 we can see that median of three Merge is a slightly better choice for arrays shorter than around 500 000 compared to Mergesort. This could be explained by remembering our input bounds. As the array grows bigger, the number of elements that is the same increases. So for big arrays with our element range, the operation of calculating the median of three will be of no use as the chance of getting three same elements to compare increases.