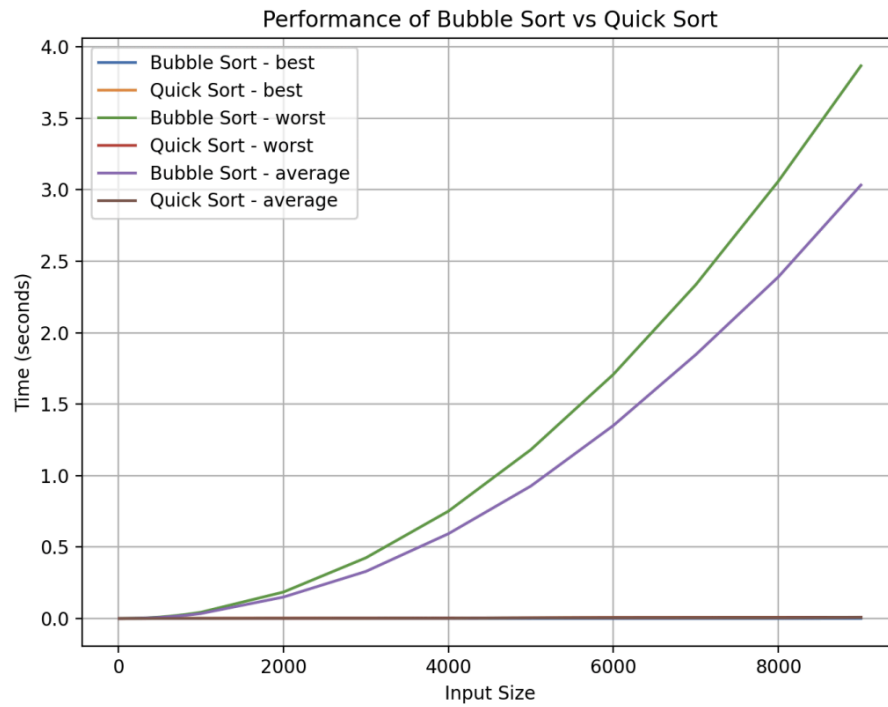
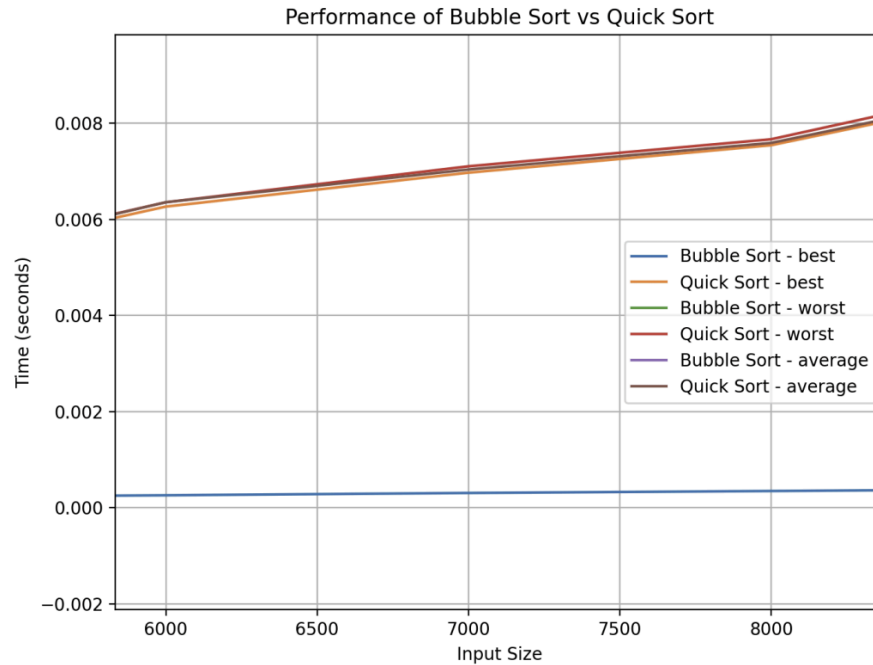


3.

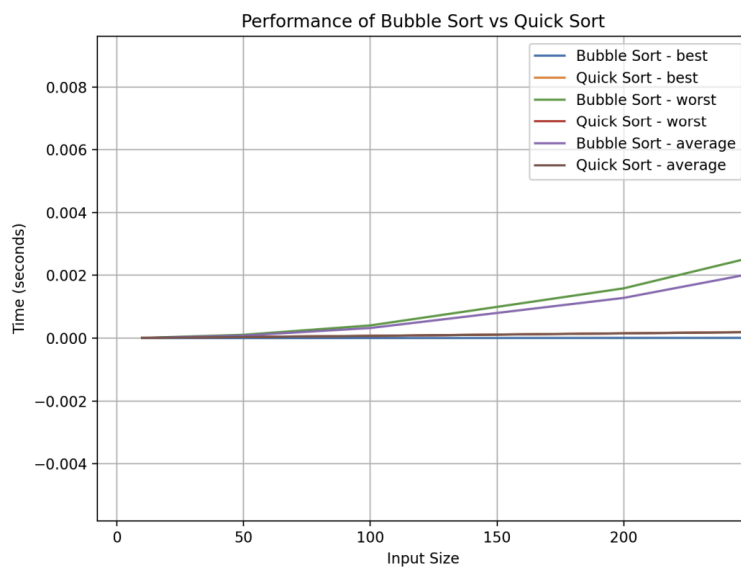


Upon inspection of the performance plots, it is evident that bubble sort consistently exhibits slower execution times, particularly in the average and worst-case scenarios. This emphasizes the superior efficiency of quicksort, especially when considering its performance in handling worst and average-case complexities.



Upon closer examination of the performance plots, two key observations emerge. Firstly, quicksort demonstrates remarkable consistency across all cases, with minimal differences in execution times between best, average, and worst scenarios. Secondly, while quicksort maintains its efficiency, bubble sort notably exhibits its fastest time complexity in the best-case scenario, where the input array is already sorted.

4.



For input sizes under 150, the time difference between bubble sort and quick sort's worst cases remains negligible, typically within a 0.001-second range, justifying this threshold for considering inputs as "small".