Report 1

In this project ,we implemented a number of sorting algorithms .All those algorithms behave as we expected, we attached results below .

(IMAGE)

We think quick sorting is the best in those algorithms .Because quick sorting does not need any extra space and it’s time complexity is O(nlogn). Although due to the different choice of pivots the time complexity can be different ,it generally behaves better than merge sorting. Selection sorting is the worst sorting algorithm in those algorithms ,it’s time complexity is

O(n^2) .Because this algorithm performs the same regardless of the input, so there is no difference between best and worst cases.

As for question 3, we think the reason we report theoretical runtimes for asymptotically large values of n is that only if n is a very large number, we can ignore the effect of constants .If we report the runtime for smaller values of n ,it would be hard for us to decide the real ‘worse’ algorithm. For example ,we have two algorithms ,ones runtime is 10000n,the others runtime is n^2. If n is smaller than 10000 ,the first algorithms would perform worse than the other one. But actually the first algorithm’s runtime is O(n),which is better than the others O(n^2).