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Cpts 350

Hw3

1. The basic approach for finding minimal and maximal is having int min and int max and replacing them while comparing items; this has 2n complexity. According to algorithm theory, we can reduce or increase the constant, which is 2.

here is an approach for this question.

Compare two items and set min1 max1. And then, compare next pair and set min2 max2. Do this for all pairs of the array. This process will need n/2 comparisons, and there will be n/2 pairs if n is even and n/2+1 pairs if n is odd.

Now do the basic approach to the pairs. Compare mins to find the minimal and compare maxs to find the maximal. We know this process needs 2n comparisons; the array size became n/2; n comparison is needed. The total comparison will be 1.5n.

2. Since S uses linear select its average case is n. T only needs to sort, so the average case of T is average case of merge sort, which is .

Since S is linear, its operation is mostly better than T. However, T would be better when the array is used again since its worst case of selecting is 1.

3. Worst case k=3

Worst case k=7

So, the worst case is n.

4. The worst case is , and the average case is

5. 5 operations are needed since 5com must process all items.