

Merge sort

1. Merge sort, TC of merge.
2. Find min using divide & conquer, TC using tree and rec. rel.

$$TC(n) = 2T\left(\frac{n}{2}\right)$$
3. Merge sort algo
4. TC of Merge sort using tree and subs.
 For every i p, merge sort has same time.
5. K sorted arrays.

Quicksort

1. Quicksort algo.
2. worst case and best case p/p. ~~avg~~
3. worst, best, average TC
4. Randomized Quicksort algo
 - ↳ expected running time to find pivot
 - ↳ Running time.
5. 2 passes position, $x \neq y$.
6. 1 pass position
7. K distinct element in quicksort -

Radix Sort

1. Finden array
2. Bucket sort $O(n)$
3. Radix sort algo
4. Running time of radix sort using Tree and rec soln
5. correctness of radix sort
6. Stable sorting algo, bucket sort of LSD \rightarrow MSD and its correctness

Insertion Sort

1. Insertion sort algo
2. its correctness, running time
3. worst case best case $\frac{1}{2}n^2$
4. average running time
5. No of inv
6. $O(n^2)$
7. $O(n^2)$