Understanding the problem statement

We have to sort a nearly sorted array, in which each element is misplaced by at most k-positions.

Approach

If we use merge sort or quick sort to sort the entire array it takes O(nlogn). But we have to use this scenario where each element is misplaced by atmost k-positions.

Assume we are using insertion sort for an element i, elements till i-1 are already sorted. As element i is misplaced by atmost k-positions, We have to make n comparisons to place element i in its correct position. So for each element we have to make k comparisons So if we use insertion sort in this case complexity is O(nk).

In nearly sorted array if k < logn then insertion sort is better.

In [ ]: