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HYBRID SORT

I HAVE TRIED MANY WAYS TO BUILD THIS FUNCTION SO HERE ARE SOME APPROACHES:

1- MERGE+QUICK+INSERTION:

IN THIS METHOD I'VE TRIED TO USE THE MERGE FUNCTION IN THE BEGINNING IN ORDER TO SPLIT THE ARRAY AND WHILE MERGING IT I TRIED TO APPLY THE QUICK SORT ON EVERY SPLITTED ARRAY THEN AFTER SORTING BOTH OF THEM, I TRIED TO COMBINE THEM AGAIN AND THEN USE THE INSERTION SORT, BUT THIS FAILED ME, AND IT DIDN'T WORK

2- MERGE + INSERTION

I TRIED INSTEAD OF USING QUICK IN THE PREVIOUS METHOD TO ONLY USE THE INSERTION AFTER SPLITTING THE TWO ARRAYS AND COMBINE THEM AGAIN, BUT IT WAS USELESS AS IT GAVE MORE TIME THAN THE MERGE SORT

3- QUICK SORT+INSERTION

IN THIS APPROACH I'VE TRIED TWO WAYS, AND BOTH WORKED WELL,

THE FIRST ONE IS TO USE PARTIAL QUICK SORT BY SORTING THE ELEMENTS UNTIL THE END - BEGIN BECOMING $< \text{ACTUAL SIZE} / 1000$

THEN AFTER THAT I USE THE INSERTION AS THE ORIGINAL ARRAY IS PARTIALLY SORTED NOW SO INSERTION WILL BE PERFECT IN THIS CASE AND IT WORKED AND GAVE ME TIME APPROXIMATELY EQUAL TO QUICK SORT.

THE SECOND WAY AND THIS IS WHAT I USED IS TO USE QUICK SORT UNTIL THE SIZE BECOMES SMALL SIZE AND I CHOSE IT 60 AFTER THAT I CAN USE INSERTION SORT AS IT WILL PROVIDE A BEST CASE BECAUSE THE ELEMENTS WILL BE PARTIALLY SORTED AGAIN.

NOTE THAT I'VE USED IS_SORTED FUNCTION TO CHECK WHETHER THE GIVEN ARRAY IS SORTED OR NOT, BECAUSE IF IT WAS SORTED I SHOULDN'T USE THE QUICK SORT TECHNIQUE, AS IT WILL GIVE ME THE WORST CASE SCENARIO.