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CPSC 1160 Assignment 4

**C)**

Random generated Array:

31832,26271,6490,21095,

437,14808,32507,26590,

16766,55,2031,28944,

4353,19107,3858,29878,

22055

Sorted array :

55,437,2031,3858,

4353,6490,14808,16766,

19107,21095,22055,26271,

26590,28944,29878,31832,

32507

**D)**

Random generated array:

31832,26271,6490,21095,

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16766,55,2031,28944,

4353,19107,3858,29878,

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4353,6490,14808,16766,

19107,21095,22055,26271,

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32507

**E)**

n – is number of elements in an array

T(n) =

Time needed for outer for &\* ( time needed for first inner loop + time needed for second inner loop)

=(n/2) \* (4n + (4n-1))

=2n^2 + 2n^2 – n/2

=(4n^2 –n/2)

Taking the greatest power term and taking constant out,

We conclude the complexity is n^2

**a)**

Best Case = already sorted array = only comparisions no swaps = n/2 \* (n + n-1) = n^2 – n/2

Worst case = swap on every comparison = 4n^2 –n/2 comparisons

Average case = 4(n/2)^2 – n/4 = n^2 – n/4

**b)**

From the analysis , the bigO remains same for all the cases while the number of comparisons change. That is so because it will take more cpu cycles to do swapping operations of an array resulting in average and worst cases , and comparatively less cycles if no swapping is done if the array was already sorted.

**F)**

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