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RANDOM

Alpha gave me 10 comparisons and 12 movements with N=5
Beta gave me 7 comparisons and 12 movements with N=5
Gamma gave me 83 comparisons and 402 movements with N=5
Delta gave me 20 comparisons and 22 movements with N=5
Epsilon gave me 8 comparisons and 24 movements with N=5
Zeta gave me 22 comparisons and 16 movements with N=5

INORDER

Alpha gave me 10 comparisons and 0 movements with N=5 Beta gave me 4 comparisons and 8 movements with N=5 Gamma gave me 4 comparisons and 0 movements with N=5 Delta gave me 5 comparisons and 1 movements with N=5 Epsilon gave me 7 comparisons and 24 movements with N=5 Zeta gave me 18 comparisons and 4 movements with N=5

Options - <u>Bubble</u>, check, <u>Insertion</u>, <u>selection</u>, <u>merge</u>, <u>quicksort</u>

I know

	Best Case Running time	Worst Case Running time	Additional Space
Selection Sort	Θ(N²)	Θ(N²)	Θ(1) - in place
Insertion Sort	Θ(N)	Θ(N²)	Θ(1) - in place
Merge Sort	Θ(N Log N)	Θ(N Log N)	Θ(N)
Quick Sort	Θ(N Log N)	Θ(N²)	Θ(log n)

Epsilon is quicksort because in both cases, there would be comparisons between the elements since it partitions. Since it is ordered there may be less comparisons because the pivot may be different.

Gamma is check sort because of the 83 comparisons. This is random so there is a low probability of getting it in order the first few times.

Delta is bubble sort because best case for bubble is O(N) and worst is $O(N^2)$. I can see this when the inorder list has n comparisons while the random list has 20 comparisons (around N^2)

Beta is Insertion sort because the best case is O(N) and when the list is in order, I see that there are 4 comparisons and 5 movements which is what I want because the list is already in order so there should be no movements.

Alpha is Merge sort because given the random and ordered list, they are both10 comparisons. I see that merge sort is O(NLogN) for both best and worse case. Given random(worst case) and inorder(best case) they are both the same comparisons.

Zeta is Selection sort because the best and worst running time are both $O(N^2)$ and I can see that even when the list is in order, there are 18 comparisons. When random, there are 22, this means that there will be around N^2 comparisons no matter what the case is.