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Homework 6

Bubble Sort and Selection Sort had the most comparisons. This is because of the similarity between the two algorithms. They have almost identical amount of comparisons, but bubble sort has more due to the fact that in it’s second for-loop it starts from the beginning again whereas selection sort does not start from the beginning each time in it’s second for-loop. The amount of assignments in bubble sort is half of its comparisons due to repeatedly swapping elements and traversing over and over again from the beginning of the array. The item assignments in selection sort were always constant (4999) due to the fact that the comparisons were made to find one place to put the value, making it so that the value was only swapped once. The Insertion Sort for the array and the linked list had similar comparisons and item assignments, which should be obvious given that they both work the same way. One more thing to note is that the item assignments were constant - similar to the selection sort, due to finding only one spot to put the value in and swapping them. However, the comparisons for the insertion sort on both the array and the list were half that of the selection sort. This is because insertion sort has to compare half the elements compared to selection sort. Quick Sort makes the least amount of comparisons aside from Merge Sort because it breaks up the list into partitions allowing for faster sorting and lower item assignments. Merge Sort has the least comparisons due to the nature of the algorithm breaking down the problem until they are resorted.