To test my sorting algorithms of insertion and selection sort for a linked list collection implementation, I added a few G-test tests that tested the various cases possible within the sorts. These included sorting random lists, descending order lists, already sorted lists, and empty lists. These all passed, and the sort functions were able to successfully sort the large randomly generated and descending order test files of sizes between 10k and 50k items. Additionally, I cleaned up some of the issues in the implementation itself that were not fixed last time, simplifying the code with newly learned techniques that make it easier to understand.

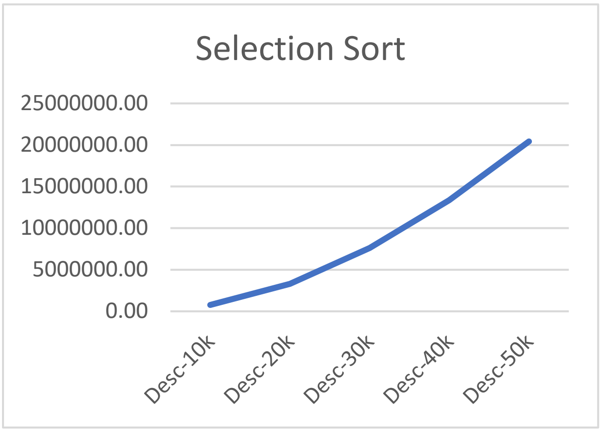
A challenge I experienced while writing this program was the fact that many of the “edge” cases are best approached by molding the whole of the algorithm around the situation you are struggling with, and that some of the best solutions may seem incorrect at first. For selection sort, the situation where the two items being swapped are adjacent seemed challenging, as the pointers were confusing, and seemed like they might cause an issue. However, on closer inspection, my algorithm did not need a special case to account for the situation, as the situation itself was resolved cleanly by the algorithm already. In that case, one of the nodes “next” pointer ends up pointing at the node itself, but that is soon resolved by the stored temporary node pointer that keeps track of the node that it should actually be pointing to, and assigns it as such later in the algorithm.

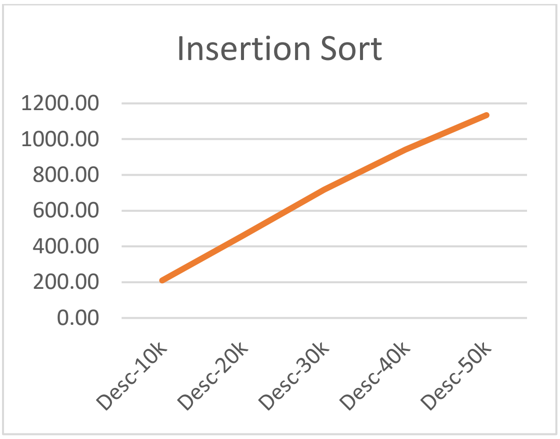
Averages:

	Desc-10k	Desc-20k	Desc-30k	Desc-40k	Desc-50k
Insertion Sort	209.80	461.20	718.20	941.80	1134.40
Selection Sort	767096.80	3306269.40	7608629.00	13354193.20	20425784.40
	Rand-10k	Rand-20k	Rand-30k	Rand-40k	Rand-50k
Insertion Sort	451290.60	2093482.20	4902573.00	8815110.20	13962625.60
Selection Sort	954908.40	4294185.80	9955949.80	17916571.20	28194430.20

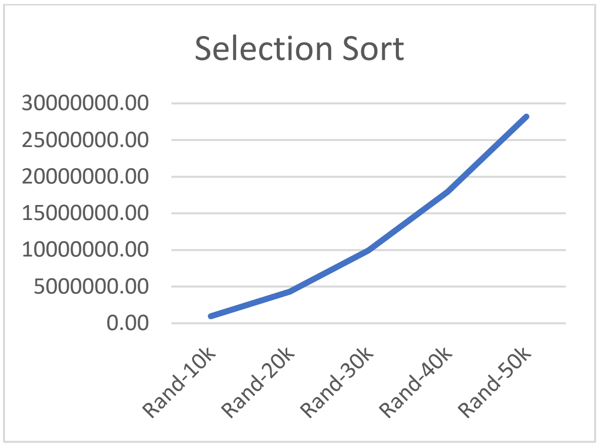
Graphs:

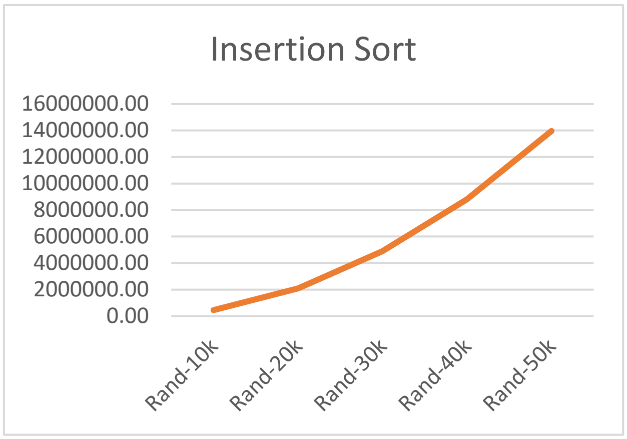
Descending order:





Random order:


Selection Sort
Rand-10k
Rand-20k
Rand-30k
Rand-40k
Rand-50k


Insertion Sort
Rand-10k
Rand-20k
Rand-30k
Rand-40k
Rand-50k