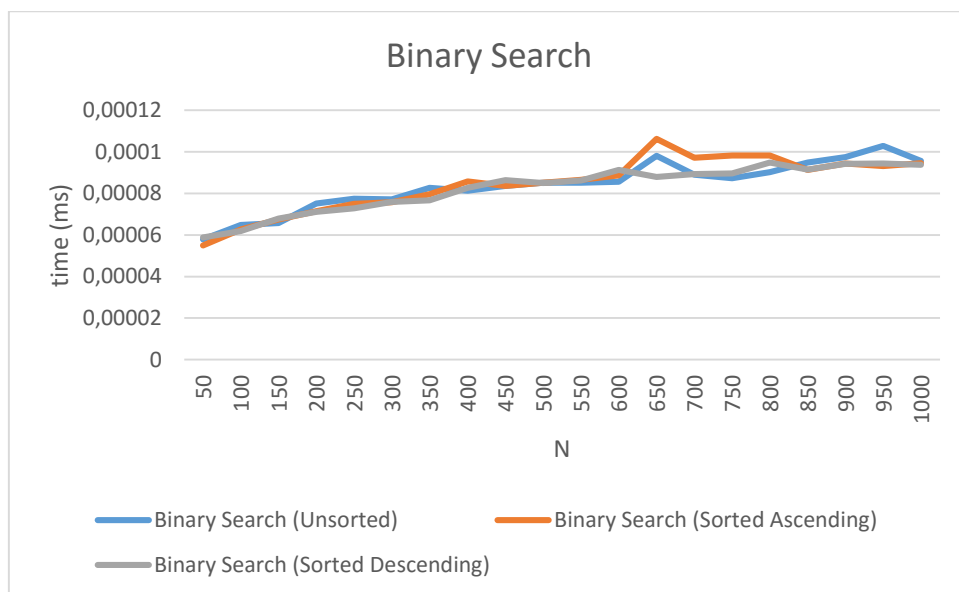
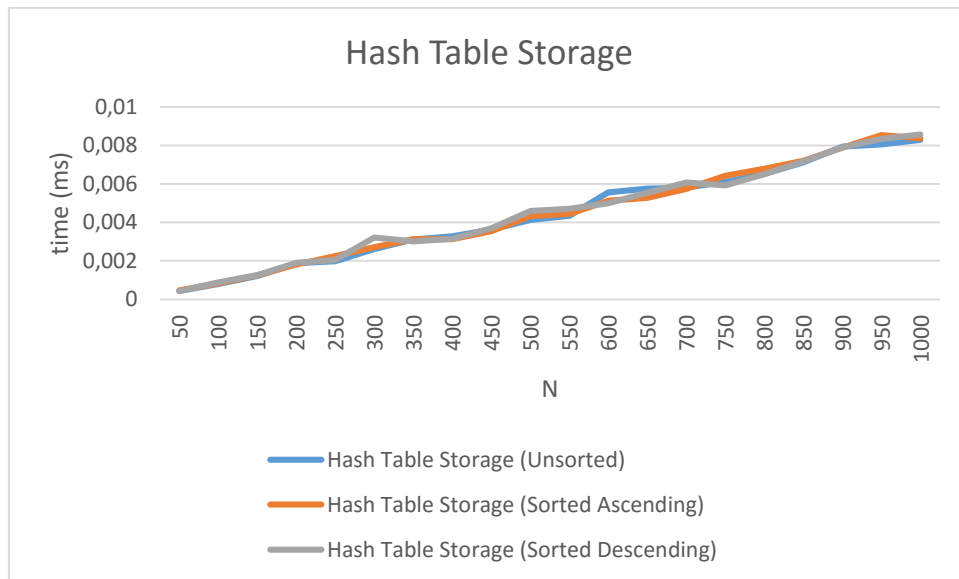


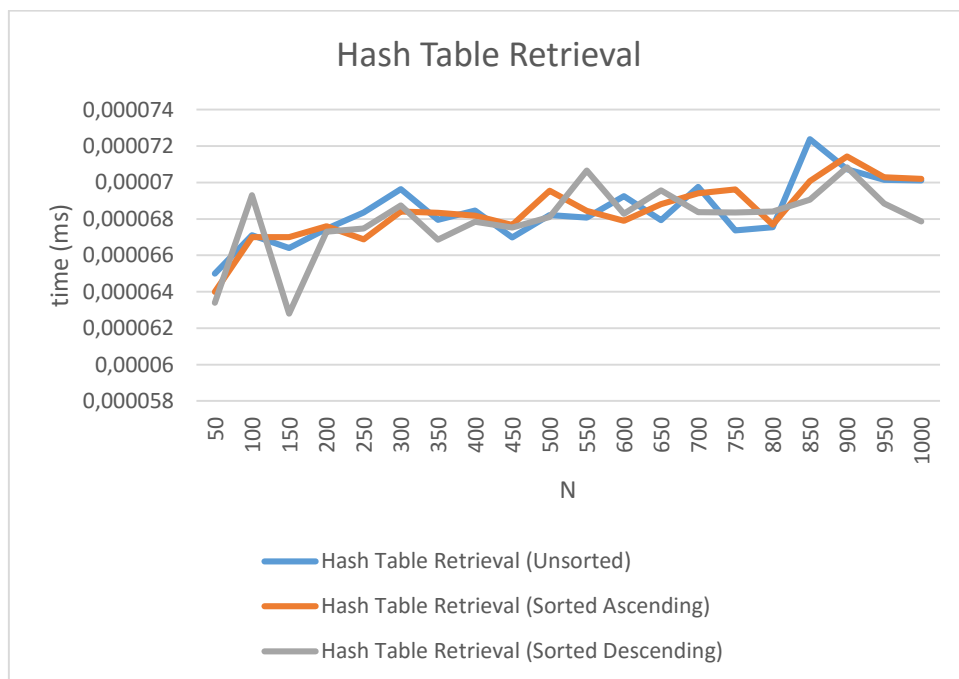
The selection sort algorithm has the time complexity of  $O(n^2)$ . This is consistent with the results of my measurements of the execution time of my implementation of the algorithm on arrays of various sizes as shown in the above line plot. The algorithm always performs the same number of operations on an array of given size regardless of the initial ordering of the data in the array, so the curves for unsorted, sorted ascending and sorted descending variants in the above line plot are virtually identical.



The binary search algorithm has the average time complexity of  $O(\log n)$ . This is consistent with the results of my measurements of the execution time of my implementation of the algorithm on arrays of various sizes as shown in the above line plot. The algorithm is run on the input data after it is sorted by the selection sort algorithm so the initial ordering of the data has no effect on the performance of this algorithm. Therefore the curves for unsorted, sorted ascending and sorted descending variants in the above line plot are virtually identical.



The operation of inserting one element into a hash table has the average time complexity of  $O(1)$ . Therefore the time complexity of inserting  $n$  elements into the hash table is  $O(n)$ . This is consistent with the results of my measurements of the execution time of my implementation of this operation with input arrays of various sizes as shown in the above line plot. The order in which the elements are added to the hash table has no effect on the execution time. Therefore the curves for unsorted, sorted ascending and sorted descending variants in the above line plot are virtually identical.



The operation of searching for one element in a hash table has the average time complexity of  $O(1)$ . This is consistent with the results of my measurements of the execution time of my implementation of this operation on hash tables with varying number of occupied entries as shown in the above line plot. The order in which the elements are added to the hash table has no effect on the execution time. Therefore the curves for unsorted, sorted ascending and sorted descending variants in the above line plot are virtually identical.

All the measurements of the hash program were made with hash tables of size  $n * 1.5$ .