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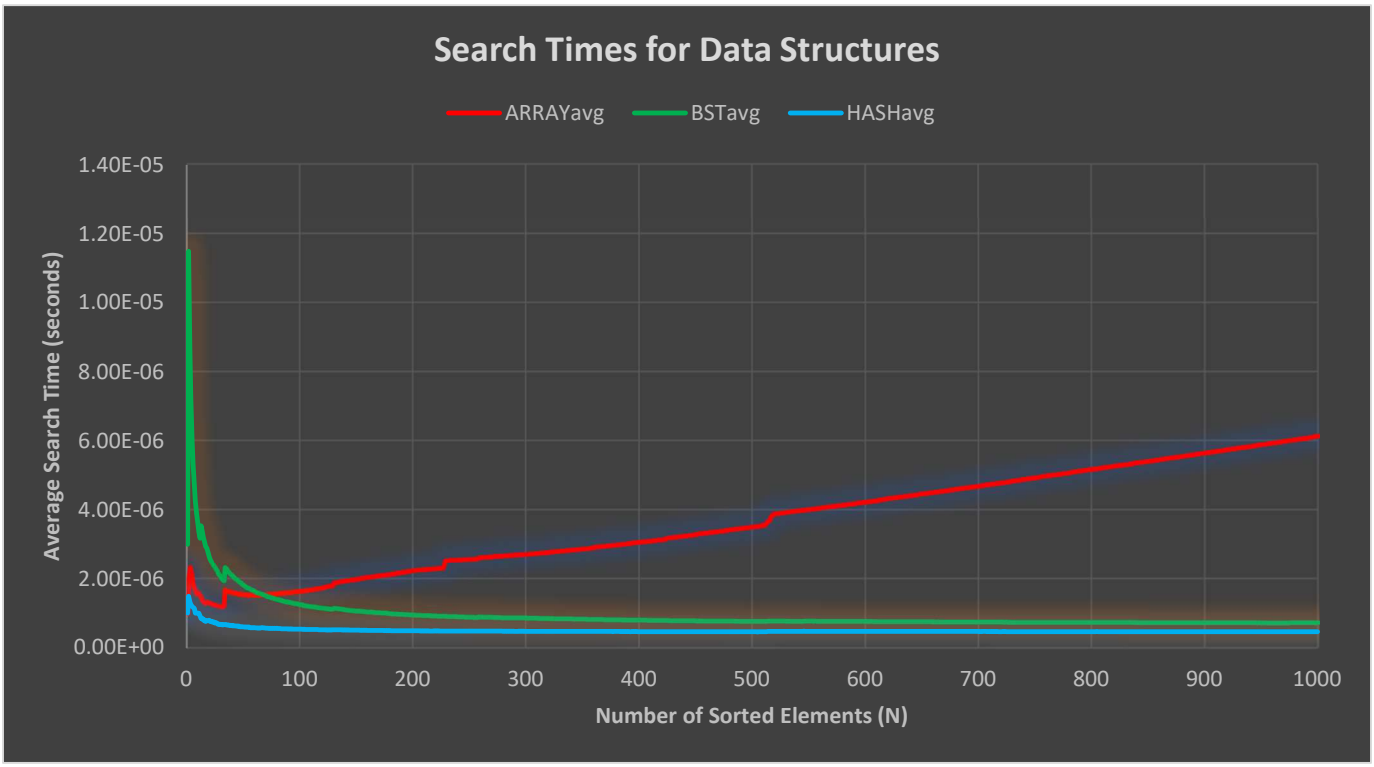
CPTS 223 – Assignment 8 Results

23 March 2022



The plot shows the average search time for different data structures (arrays, balanced binary search tree, and hash table) depending on a number of elements to search for (N). The plot shows that as the number of elements to search for increases, the array data structures time complexity increases almost linearly, but the BST and hash table implementations converge to a much quicker rate with the hash table being slightly faster than the BST. These results are as expected because the array search methods may have to run through the whole array to find an element, or O(n) time. The BST data structure runs even faster because it continuously splits the elements it must go through in half (O(logn)). Finally, the hash table, as shown, is the fastest because of its nature of having a hash function to almost always map to the element it is looking for immediately (O(1)).