**Project 2: AVL/BST Compare w/Inheritance**

Intel Core i7-4770 @3.40GHz with 16GB RAM and a 7200rpm, 2TB HDD, Win10

All values are in milliseconds

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ***Insertions*** | | |  |
| ***N*** | ***1000*** | ***10000*** | ***100,000*** | ***1,000,000*** |
| ***BST*** | *0* | *4* | *45* | *405* |
| ***AVL*** | *0* | *7* | *80* | *768* |
|  |  |  |  |  |
|  |  |  |  |  |
|  | ***Removals*** | | |  |
| ***N*** | ***1000*** | ***10000*** | ***100,000*** | ***1,000,000*** |
| ***BST*** | *0* | *2* | *28* | *95* |
| ***AVL*** | *0* | *3* | *41* | *159* |
|  |  |  |  |  |
|  |  |  |  |  |
|  | ***Totals*** | | |  |
| ***N*** | ***1000*** | ***10000*** | ***100,000*** | ***1,000,000*** |
| ***BST*** | *0* | *6* | *73* | *500* |
| ***AVL*** | *0* | *10* | *121* | *927* |

Interestingly, I found that on my most advanced computer, my 2 year old MSI GS63VR laptop, running an Intel Core i7-6700 @ 2.60GHz (4 cores) with 16GB RAM and an 512GB SSD ran this comparison nearly 2X slower with 1 million elements than my 5 year old Alienware X51 R2 with an Intel Core i7-4770 @3.40GHz (4 core) with 16GB RAM and a 7200rpm, 2TB HDD which this report is based on. Both are running Windows 10, although the version on the newer MSI is slightly outdated.

The cslab3 computer, running an Intel Xeon W3503 @ 2.40GHz (2 cores) with about 2GB RAM and an HDD that looks to be about 2TB, speed unknown, the comparisons ran nearly 3x slower.

With the exception of cslab3, all systems ran the comparison from a fresh boot.

Regarding the first two systems, according to cpw-world.com, i7 6700 “has 33% higher memory bandwidth, owing to faster supported memory. The i7-6700HQ processor officially supports DDR4-2133 memory, whereas the Intel i7-4770 is limited to 1600 MHz data rate. Higher memory bandwidth improves performance in memory bound tasks. Performance improvement in programs, that are not memory-bound, will be much lower than 33%.” Surprisingly, the i7-4770 L3 cache is 2MB larger. Furthermore, the i7-4770, being a desktop processor, consumes power at nearly double the i7-6700 and this is due to the smaller memory bandwidth that the i7-4770 is saddled with. Despite the limitations and age of the i7-4770, the larger L3 cache and the much higher operating frequency gives it the edge in our comparison.