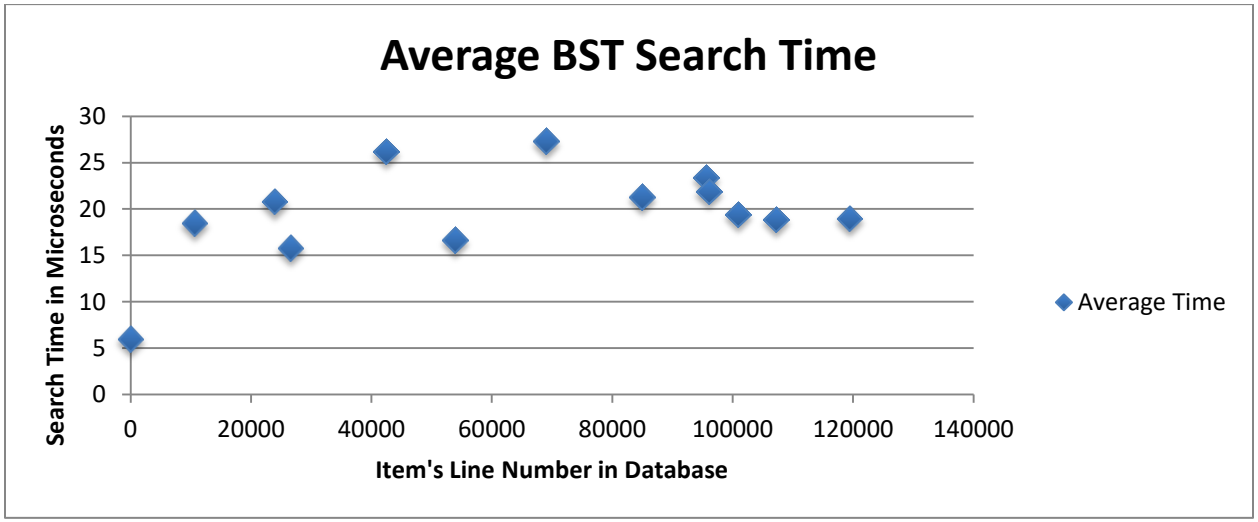
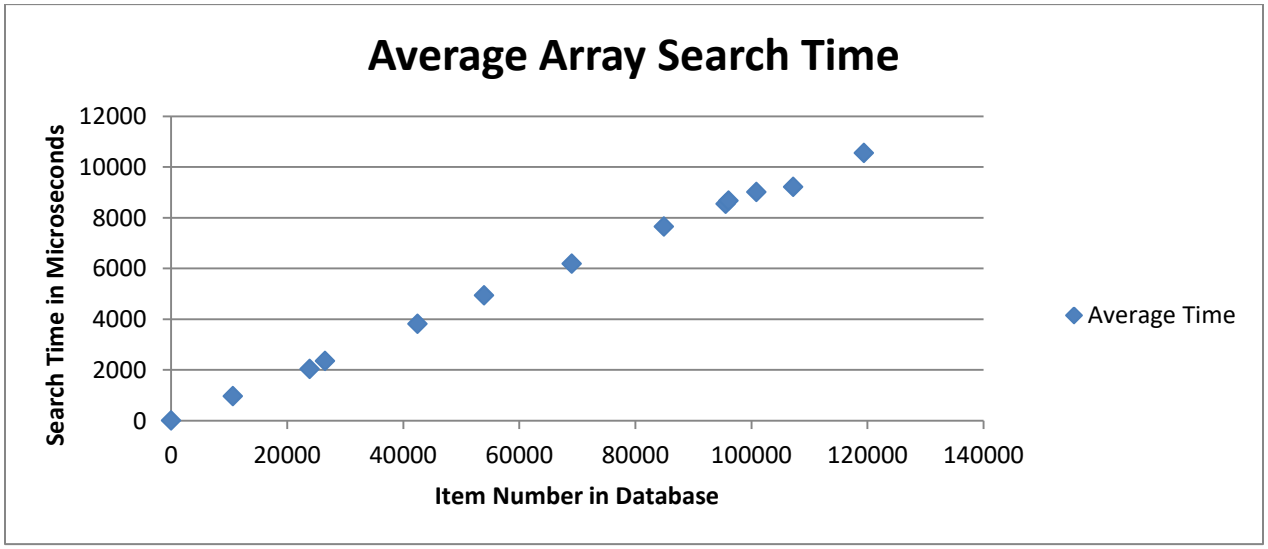
Dawson Murphy CS300 Assignment 4

		Time for BST (microseconds)										
UPC Code	Line # in Database	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 9	Test 10	Average Time
701197194311	5	6	6	5	6	6	6	6	6	6	7	6
799439078727	10,624	19	18	18	20	18	19	17	20	18	18	18.5
4605922001812	23,898	22	20	21	20	20	21	21	20	21	22	20.8
751492439181	26,551	16	15	15	16	16	15	17	16	16	16	15.8
886970578424	42,478	26	28	24	26	25	22	28	27	29	27	26.2
662102111321	53,920	16	17	18	17	17	16	17	16	16	17	16.7
35826072672	69,038	26	27	28	28	28	28	26	27	28	27	27.3
601290430654	84,969	21	23	21	22	21	21	22	21	20	21	21.3
603899051650	95,572	22	24	23	24	25	23	23	24	22	24	23.4
352688190925	96,057	20	21	23	22	21	23	22	22	22	23	21.9
12000004032	100,879	20	19	20	19	21	19	18	19	20	19	19.4
7051057658877	107,224	18	19	19	19	20	19	18	19	18	20	18.9
79118004132	119,423	18	19	19	20	19	20	19	18	19	19	19



Dawson Murphy CS300 Assignment 4

		Time for Array (microseconds)										
UPC Code	Line # in Database	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 9	Test 10	Average Time
701197194311	5	5	5	5	5	5	5	5	6	5	5	5.1
799439078727	10,624	954	936	928	980	992	956	997	978	984	963	966.8
4605922001812	23,898	2090	2062	2062	2024	2085	1938	2107	1937	1942	2188	2043.5
751492439181	26,551	2492	2401	2353	2278	2379	2251	2279	2431	2314	2319	2349.7
886970578424	42,478	3810	3830	3827	3776	3926	3830	3771	3776	3765	3812	3812.3
662102111321	53,920	4933	4964	5012	5122	4882	4944	4924	4758	4861	4987	4938.7
35826072672	69,038	6258	6062	6110	6173	6118	6280	6219	6282	6256	6132	6189
601290430654	84,969	7685	7668	7613	7641	7811	7469	7647	7682	7693	7535	7644.4
603899051650	95,572	8444	8703	8373	8496	8536	8467	8637	8718	8548	8514	8543.6
352688190925	96,057	8415	8707	8602	8586	8672	8832	9002	8733	8421	8757	8672.7
12000004032	100,879	9045	9059	9053	9047	9043	8905	9057	8771	9015	9088	9008.3
7051057658877	107,224	9141	9133	9338	9118	9233	9385	9221	9017	9158	9453	9219.7
79118004132	119,423	10756	10565	10670	10710	10417	10304	10496	10657	10543	10407	10552.5



As shown in during the tests, the Binary Search Tree and the Array have about the same performance when searching for an item in a small dataset (or when searching for an item near the front in a large dataset). However, as the item being searched for gets further back in the dataset, the Binary Search Tree becomes much more efficient than the Array at finding items. The extreme example of this in this test is the Binary Search Tree taking an average of 19 microseconds to find 79118004132, while the Array takes an average of 10552.5 microseconds to find it. This is to be expected, since the complexity of searching through a Binary Search Tree is O(log(n)), while the complexity of searching through an Array is O(n).