Insertion Sort Results:

Population:
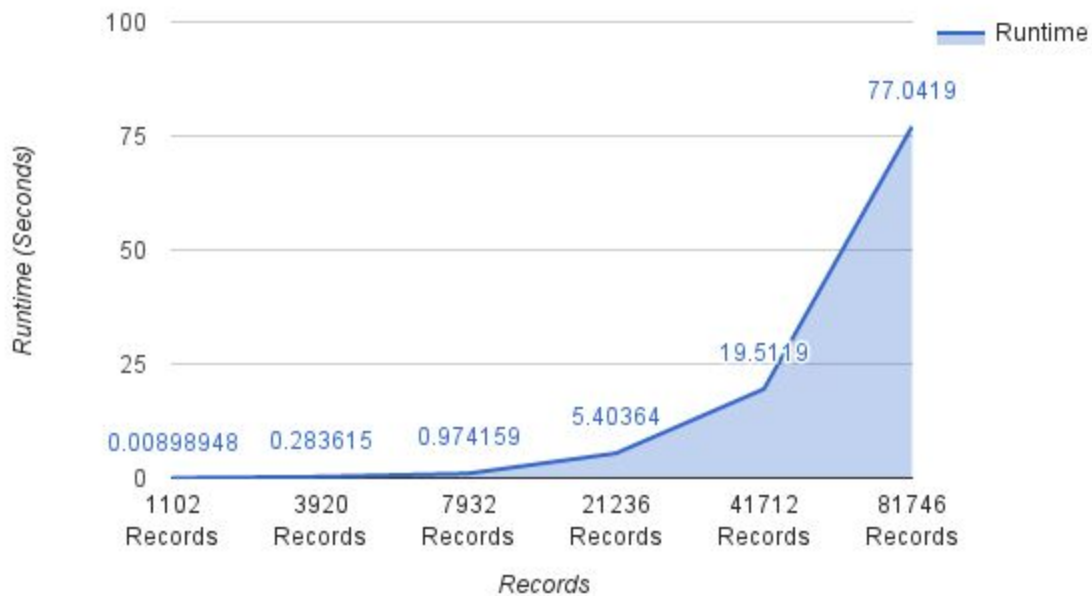
	1st Tests	2nd Test	3rd Test	4th Test	5th Test	Best Time
AL-AL (1102 Records)	0.00318419 sec.	0.00320383 sec.	0.00765258 sec.	0.00325361 sec.	0.0032695 sec.	0.00318419 sec.
AL-CA (3920 Records)	0.0318548 sec.	0.0333545 sec.	0.0322394 sec.	0.0828979 sec.	0.0764835 sec.	0.0318548 sec.
AL-ID (7932 Records)	0.463086 sec.	0.465639 sec.	0.473378 sec.	0.471032 sec.	0.457642 sec.	0.457642 sec.
AL-IA (21236 Records)	2.11375 sec.	2.35814 sec.	2.44746 sec.	2.41126 sec.	2.3185 sec.	2.11375 sec.
AL-MO (4172 Records)	7.85724 sec.	8.08515 sec.	8.05565 sec.	7.83289 sec.	7.79207 sec.	7.79207 sec.
Census2010 (81746 Records)	30.2974 sec.	28.3268 sec.	27.1314 sec.	28.7394 sec.	27.1769 sec.	27.1314 sec.

Insertion Sort: Population Tests
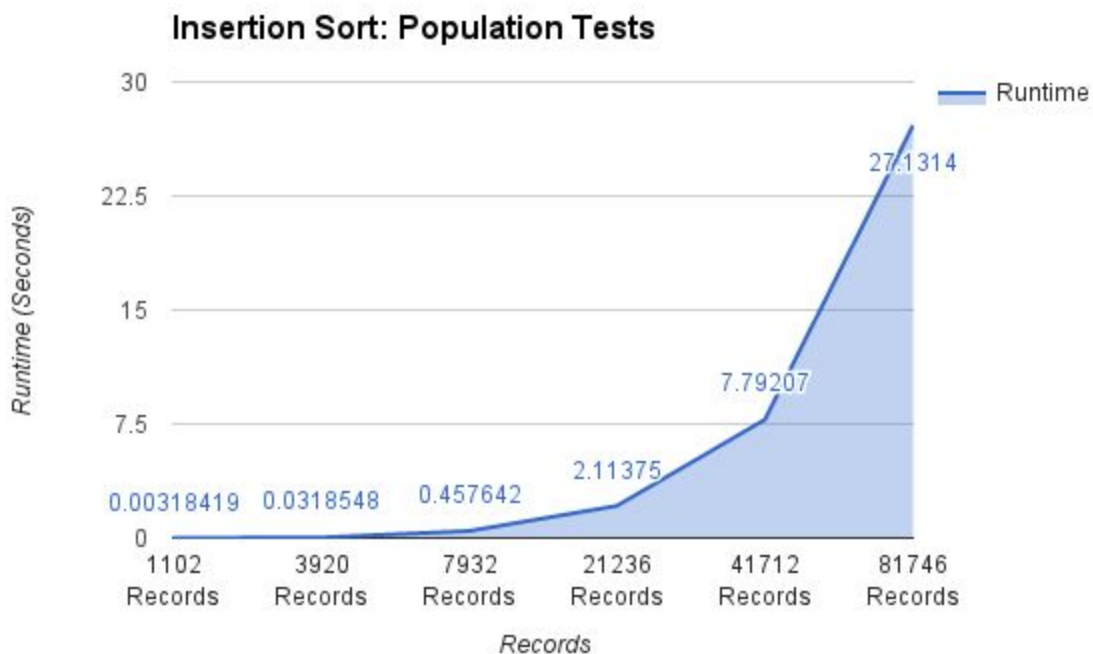
City Name:

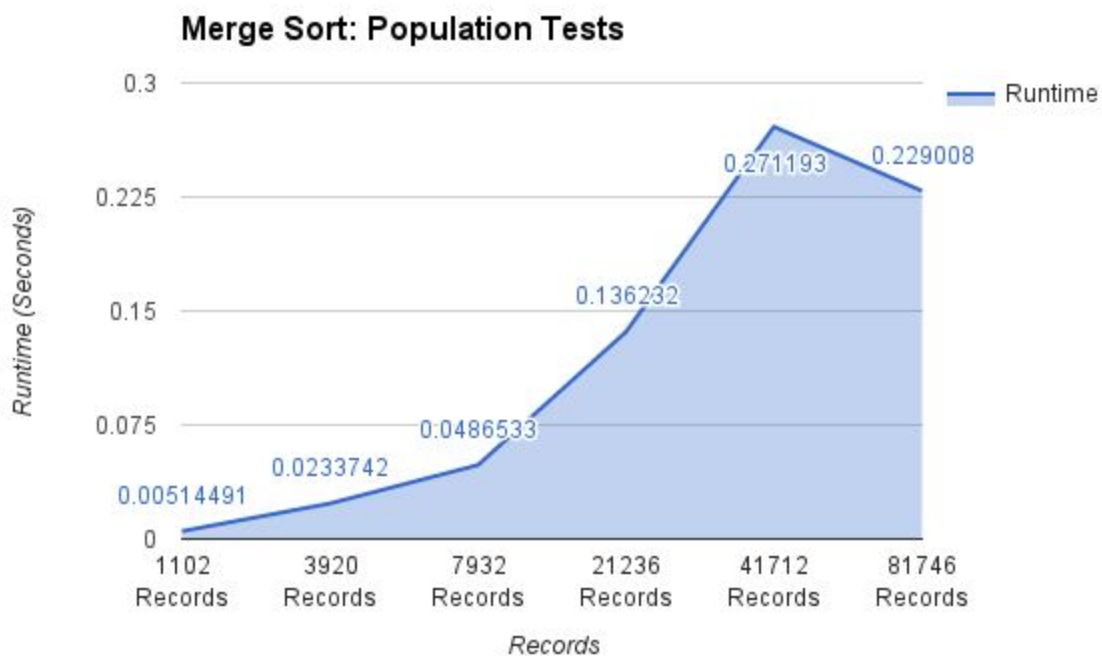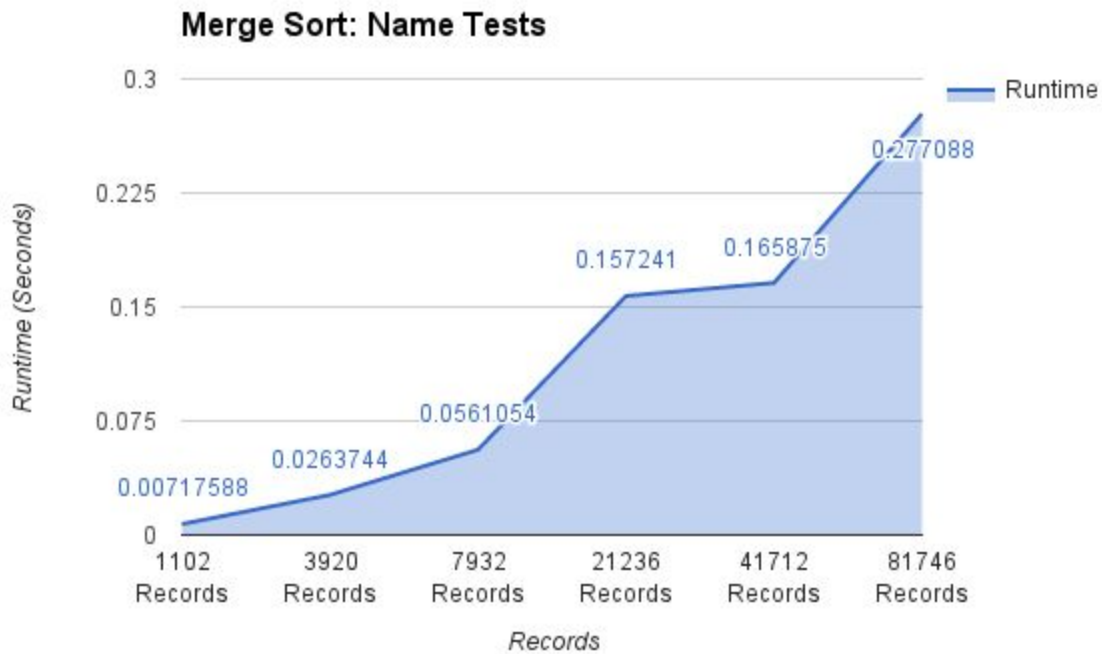|	1st Tests	2nd Test	3rd Test	4th Test	5th Test	Best Time
AL-AL (1102 Records)	0.0217893 sec.	0.0090874 sec.	0.00898948 sec.	0.0092273 sec.	0.00929946 sec.	0.00898948 sec.
AL-CA (3920 Records)	0.341246 sec.	0.333682 sec.	0.283615 sec.	0.328565 sec.	0.327712 sec.	0.283615 sec.
AL-ID (7932 Records)	1.01109 sec.	1.04837 sec.	0.974159 sec.	1.31074 sec.	1.32403 sec.	0.974159 sec.
AL-IA (21236 Records)	5.41396 sec.	5.99439 sec.	6.41193 sec.	5.91639 sec.	5.40364 sec.	5.40364 sec.
AL-MO (4172 Records)	22.7904 sec.	19.8929 sec.	19.5119 sec.	19.773 sec.	20.9959 sec.	19.5119 sec.
Census2010 (81746 Records)	78.9493 sec.	82.8774 sec.	78.1763 sec.	91.4959 sec.	77.0419 sec.	77.0419 sec.

Insertion Sort: Name Tests

Merge Sort Results:

Population:

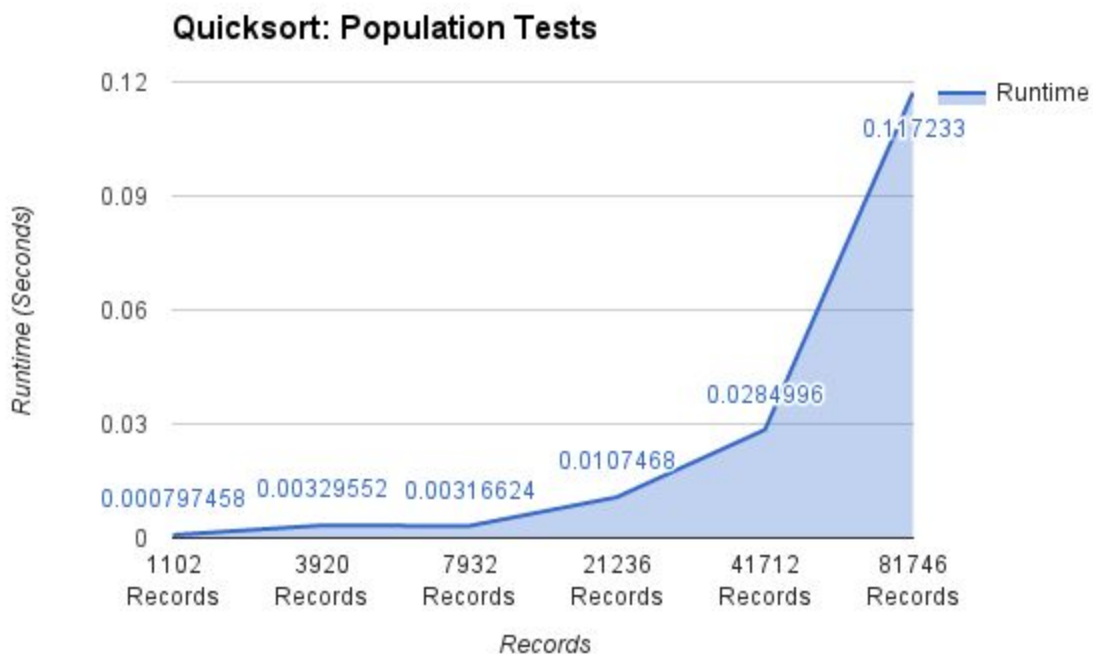|	1st Tests	2nd Test	3rd Test	4th Test	5th Test	Best Time
AL-AL (1102 Records)	0.00514491 sec.	0.00657648 sec.	0.00651562 sec.	0.00657377 sec.	0.00640827 sec.	0.00514491 sec.
AL-CA (3920 Records)	0.0233742 sec.	0.0246281 sec.	0.0236709 sec.	0.0237048 sec.	0.0233993 sec.	0.0233742 sec.
AL-ID (7932 Records)	0.0495431 sec.	0.049184 sec.	0.0486989 sec.	0.0486533 sec.	0.0488353 sec.	0.0486533 sec.
AL-IA (21236 Records)	0.136788 sec.	0.136232 sec.	0.137083 sec.	0.139085 sec.	0.138694 sec.	0.136232 sec.
AL-MO (4172 Records)	0.276086 sec.	0.271193 sec.	0.274308 sec.	0.276042 sec.	0.272538 sec.	0.271193 sec.
Census2010 (81746 Records)	0.303211 sec.	0.446155 sec.	0.32257 sec.	0.336653 sec.	0.229008 sec.	0.229008 sec.

Merge Sort: Population Tests

City Name:

|	1st Tests	2nd Test	3rd Test	4th Test	5th Test	Best Time
AL-AL (1102 Records)	0.00739368 sec.	0.00719834 sec.	0.00717588 sec.	0.00727291 sec.	0.0071798 sec.	0.00717588 sec.
AL-CA (3920 Records)	0.0264198 sec.	0.027053 sec.	0.0266101 sec.	0.0263744 sec.	0.0281568 sec.	0.0263744 sec.
AL-ID (7932 Records)	0.0603032 sec.	0.0566388 sec.	0.0561054 sec.	0.0563971 sec.	0.0614866 sec.	0.0561054 sec.
AL-IA (21236 Records)	0.158401 sec.	0.157729 sec.	0.160994 sec.	0.17238 sec.	0.157241 sec.	0.157241 sec.
AL-MO (4172 Records)	0.3145 sec.	0.32309 sec.	0.320912 sec.	0.165875 sec.	0.319467 sec.	0.165875 sec.
Census2010 (81746 Records)	0.37122 sec.	0.620533 sec.	0.289664 sec.	0.331087 sec.	0.277088 sec.	0.277088 sec.

Merge Sort: Name Tests

Quicksort Results:

Population:

	1st Tests	2nd Test	3rd Test	4th Test	5th Test	Best Time
AL-AL (1102 Records)	0.000830816 sec.	0.000888243 sec.	0.000877224 sec.	0.000797458 sec.	0.000879281 sec.	0.000797458 sec.
AL-CA (3920 Records)	0.00329552 sec.	0.0037027 sec.	0.00341699 sec.	0.00356572 sec.	0.00385647 sec.	0.00329552 sec.
AL-ID (7932 Records)	0.00763508 sec.	0.00769606 sec.	0.00784684 sec.	0.00316624 sec.	0.00357868 sec.	0.00316624 sec.
AL-IA (21236 Records)	0.0107706 sec.	0.0108311 sec.	0.0112509 sec.	0.0116292 sec.	0.0107468 sec.	0.0107468 sec.
AL-MO (4172 Records)	0.0670683 sec.	0.0284996 sec.	0.0684953 sec.	0.0669073 sec.	0.0671509 sec.	00.0284996 sec.
Census2010 (81746 Records)	0.129156 sec.	0.117233 sec.	0.171492 sec.	0.167041 sec.	0.164162 sec.	0.117233 sec.

Quicksort: Population Tests

City Name:

	1st Tests	2nd Test	3rd Test	4th Test	5th Test	Best Time
AL-AL (1102 Records)	0.001689 79 sec.	0.00198151 sec.	0.00172597 sec.	0.00178369 sec.	0.00166722 sec.	0.00166722 sec.
AL-CA (3920 Records)	0.006714 57 sec.	0.00946474 sec.	0.00703333 sec.	0.00678215 sec.	0.00620386 sec.	0.00620386 sec.
AL-ID (7932 Records)	0.007612 32 sec.	0.01978 sec.	0.0190257 sec.	0.00859753 sec.	0.00960443 sec.	0.00761232 sec.
AL-IA (21236 Records)	0.053176 6 sec.	0.0494303 sec.	0.0620928 sec.	0.047681 sec.	0.050948 sec.	0.047681 sec.
AL-MO (4172 Records)	0.091533 7 sec.	0.117176 sec.	0.109743 sec.	0.114817 sec.	0.119611 sec.	0.0915337 sec.
Census2010 (81746 Records)	0.173888 sec.	0.286514 sec.	0.279829 sec.	0.246675 sec.	0.249103 sec.	0.173888 sec.

Quicksort: Name Tests
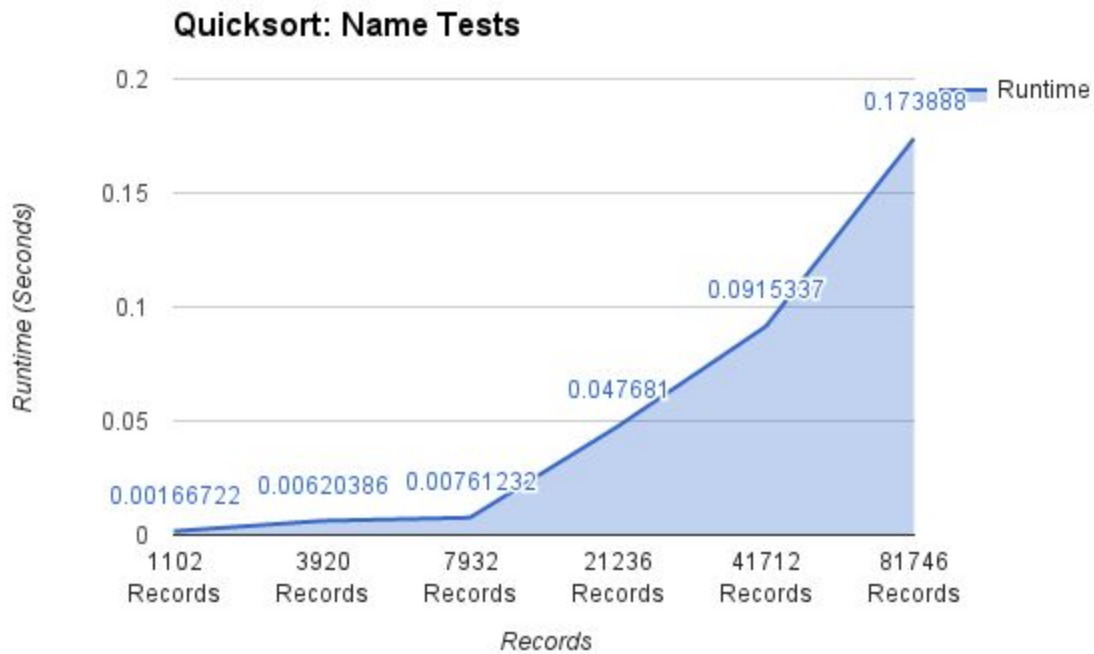
Conclusions:

Insertion Sort is a proficient sorting algorithm when it comes to sorting a small amount of elements, but it's slower when sorting a large number of elements. At times (when the program is sorting less than 10k records), it sorts faster than Quicksort but the runtime increases significantly once the amount of record goes up. Since the original list of records wasn't ordered the runtime complexity of the algorithm was O(n^2) time – the average case scenario.

Mergesort and Quicksort have very similar runtimes when both are compared to Insertion sort. Both can sort a small or large amount of elements in less than a second. The run time complexity of the two sorting methods was O(n log n) time because the records weren't ordered.

On a side note, in all three sort methods, the time it takes to sort the records by city names almost doubles when compared to sorting them by population. The city names are longer strings, so there were more characters to compare to each other which increased the runtime of the algorithm.