Algorithm	Time Complexity	Measured Time
Bubble Sort	O(n^2)	1.0050420761108398 seconds
Selection Sort	O(n^2)	1.9540390968322754 seconds
Insertion Sort	O(n^2)	2.1401889324188232 seconds
Merge Sort	O(n log n)	1.0050699710845947 seconds
Quick Sort	O(n log n) (average)	0.01531982421875 seconds

The timing results show major differences in performance between the sorting algorithms. Quicksort was the fastest algorithm, completing in approximately 0.015 seconds. This is expected as Quicksort is highly efficient on large random datasets and benefits from in-place partitioning and good cache performance.

Quicksort showed its expected average-case O(n log n) and was dramatically faster than all other algorithms. Merge Sort also exhibited O(n log n) performance, although its runtime was closer to the quadratic algorithms than expected.

Overall, the results support the theoretical expectation that O(n log n) algorithms are significantly more efficient than O(n^2) algorithms for large inputs, though real-world performance can vary based on implementation details.

Merge Sort is practical for large datasets when predictable performance or stability is required, but it may be slower than other O(n log n) algorithms in practice. Quicksort is clearly the most practical choice for large datasets in this experiment, offering the best performance by a wide margin.