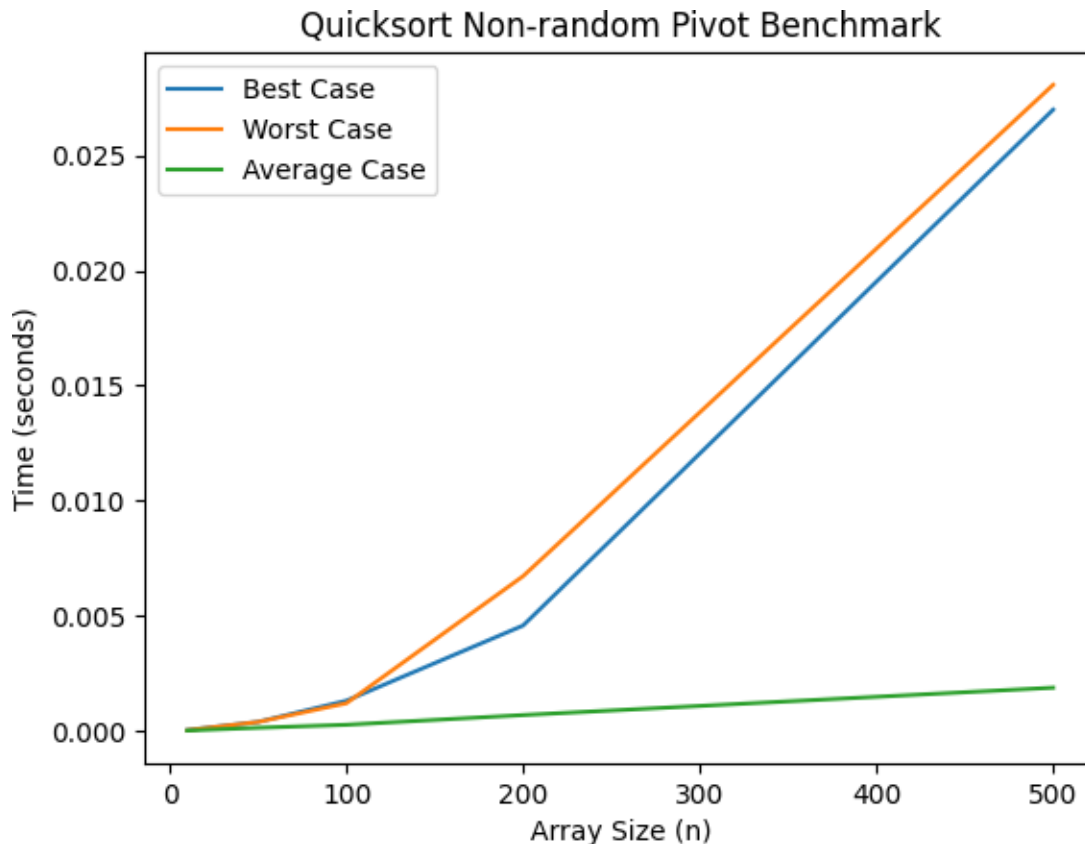**2.** Quicksort Non-random Pivot Benchmark.

3. Mathematically derive the average runtime complexity of the non-random pivot version of quicksort?

The average runtime complexity of the non-random pivot version of quicksort is **O(nlogn).** In other words, time taken to sort an array with size n is **nlogn**.

In quicksort, a pivot element and partition the array into three different groups: elements which is greater than the pivot, elements which are equal to the pivot, and elements which is less than the pivot. The recurrence relation **T(n) = n + 2T(n/2)** where T(n) represents average time Complexity of quicksort with array size n, and we assume that the pivot divides the array into parts of equal size.

T(n) = n + 2T(n/2) solving the T(n) using Master Theorem, the average runtime complexity **is O (n log n)** which is efficient and balanced for different inputs.