

4.1

$$T(n) = n + (n-1) + (n-2) + \dots + 3 + 2 + 1 \longrightarrow n(n+1)/2$$

Which simplifies to $O(n^2)$

4.2

First Iteration:

Pivot: 16

Less: [] (No elements less than 16)

Equal: [16]

Greater: [15, 14, ..., 1]

Recursively sort less and greater.

New Vector: [] + [16] + quicksort([15, 14, ..., 1])

Second Iteration (Sorting [15, 14, ..., 1]):

Pivot: 15

Less: [] (No elements less than 15)

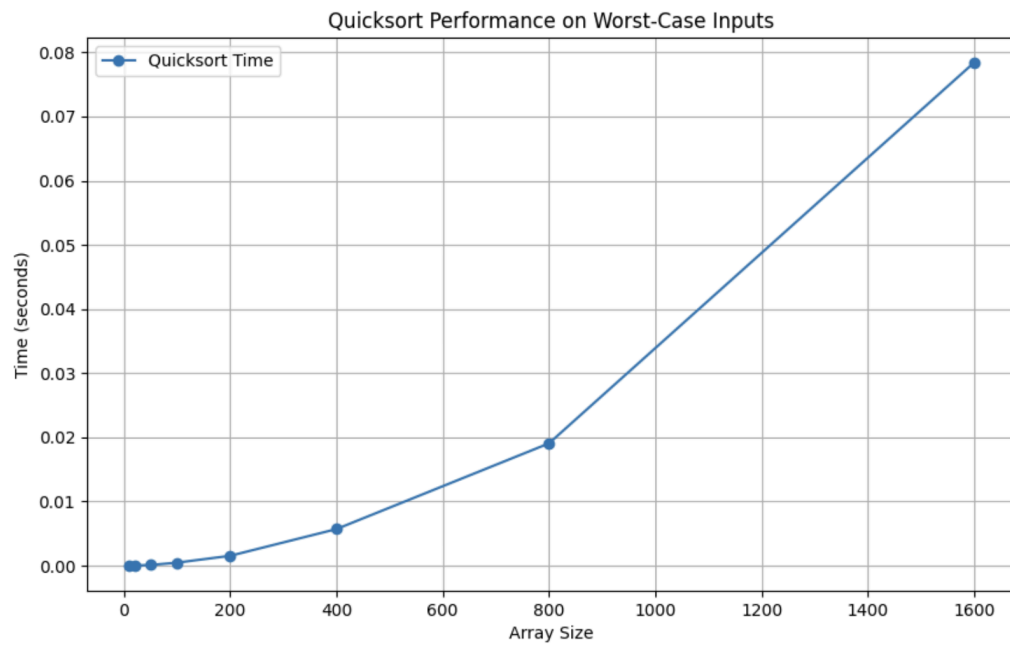
Equal: [15]

Greater: [14, 13, ..., 1]

New Vector: [] + [15] + quicksort([14, 13, ..., 1])

The iteration continues each time reducing the size of the array by 1

4.4



Yes, the results do match the complexity analysis.