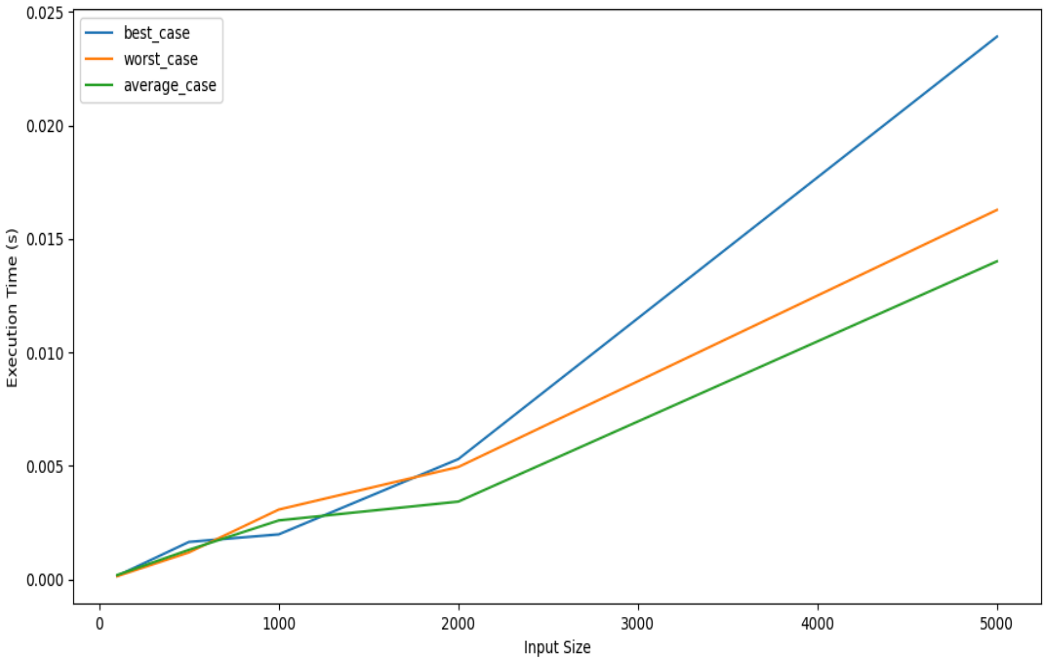
Benchmarking results:



Average runtime complexity of the non-random pivot version of quicksort:

The non-random pivot version of quicksort has the following recurrence relation:

$T(n) = T(k) + T(n-k-1) + \theta(n)$

n = size of the input array

k = index of pivot element after partitioning

$\theta(n)$ = time spent on partitioning

In average case we assume that every element has an equal probability of being chosen as the pivot. The expected value of k is n/2.

Substituting the expected value of k in the recurrence relation,

$T(n) = 2T(n/2) + \theta(n)$

By Master's theorem, $T(n) = \theta(n \log n)$

This implies that on average, quicksort exhibits a logarithmic growth rate with respect to input size.