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Hands on - 6

3) The average run time complexity of the non random pivot version of Quicksort

Let the T(n) be time complexity of sorting array size n.

→ the pivot divides array into two approximately equal halves.

$$T(n) = T(n/2) + T(n/2) + O(n)$$

$$T(n) = 2T(n/2) + O(n)$$

by masters theorem.

$f(n) = O(n)$

$f(n) = O(n^{\log_b a - \varepsilon})$ ∀ for $\varepsilon > 0$

$$T(n) = O(n^{\log_b a}) = O(n^{\log_2 2}) = \Theta(n)$$

recursive depth of tree is $\log_2 n$. total becomes

$$T(n) = O(n \log n)$$

∴ Avg case: $O(n \log n)$