Sailbrations Sailbrations Sailbrations VIAID: 1002190695

Tin) = 109 = 0.00 + 0.7(1)

Hands On - 6 = 101 = 101

3. Mathematically derive—the average runtime complexity of the non-random pivot version of quickSort.

Let's first consider the away size of 'n'.

The recurrence relation for the quick sort is

defined T(n).

T(n) > average runtime of quicksort of Size 'n'.
For the average case,

Pivot divides the array into two partitions equally.

Then the recurrence relation for the average Scenario is

here, 27(1/2) represents average time for two recursive calls of Size 1/2.

from above equation, $T(n) = O(n) + 2 \cdot T(n/2)$ $T(n) = O(n) + 2 \left(O(\frac{n}{2}) + 2 \cdot T(\frac{n}{4})\right)$ $T(n) = O(n) + 2 \cdot O(\frac{n}{2}) + 4 \cdot T(\frac{n}{4})$ $T(n) = O(n) + O(n) + 4 \left(O(\frac{n}{4})\right) + 8 \cdot T(\frac{n}{8})$ \vdots $T(n) = K \cdot O(\frac{n}{2}) + 2 \cdot T(\frac{n}{2})$

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here let's assume k iterations
     case Size will be I when reaches base
          T(n) = 1092 n. O(1) + n. T(1)
         here T(1) > constant
      .. Therefore, the runtime Complexity of
   quick sort for average case using the
   non-random pivot is (Milogn)
           T(n) = 0 (nlogn).
  Let's first consider the analy size of 'n'.
   the recurrence relation for the quicksoit is
-1(U) > aresable invitive of discreary of 2136,0.
                     For the average case,
Pivot divides the array into two partitions
 That the recurrence relation for the average
                                 Scenario is
                T(11) = ((0)) +2-1((1))
out- 101 topiesents average time for the
                 reconsive calls of size n/2.
                      from above equation,
                 T(1) = (0(1) + 2.7(1/2)
    T(0) = C(0) +2 (C(2)+2.7(2))
      T(1) - (0(1) + 2.0(2) + 4.7(2))
160) = C(10) = C(10) = (10) = 8 - (1/8)
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