1) $n = 5^k$

$C_W = 2 \qquad C_W(n) = C_W(L^{n/5} + 2)$
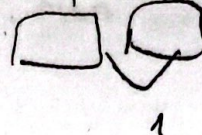
$C_W(5^k) = C_W(5^{k-1}) + 2$

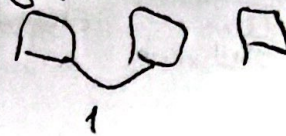$\qquad = C_W(5^{k-2}) + 2 + 2$

$\qquad = C_W(5^{k-3}) + 2 + 2 + 2$

$\qquad \vdots$

$\qquad = C_W(5^{k-k}) + k \cdot 2 = 0 + 2k \in \Theta(\log n)$

2) $14; 2, 5; 7; 45, 77, 1, \boxed{55}, 47, 63, 18, 20, 54, 28, 35$

pivot: 14

45

1st call:
pivot: 14

1 2 5 7

1 2 5 7

2 5 7

5 7

1st call:
pivot: 14

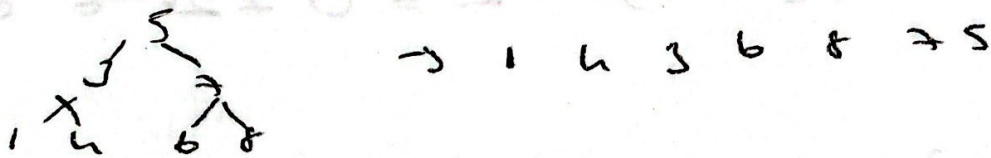2 5 7 14 45 77 55 47 63 18 20 54 28 35

2nd call:

2 5 7 14 45 77 55 18 20 28 35 47 54

5.) Hoare, Lomuto'dan daha verimlidir. Çünkü ortalama olarak 3 kat daha az takas yapar ve tüm değerler eşit olduğunda bile verimli bölümler oluşturur.

4) The best case for Quicksort algorithm. last elements as pivot is the post - order traversal of the balanced binary search tree

For ex:

→ 1 4 3 6 8 7 5

3. The worst case occurs when pivot elements splits the array as unequally as possible, and ideal n/2 elements in the smaller half, we get zero - meaning the pivot is the biggest or smallest in the array. when the pivot choosing algorithm is to pick the middle element, basically worst case occurs; it leaves one partition empty.