Median.

1 2 3 4 [5] 6 7 8 9

1 2 3 [4 5] 6 7 8

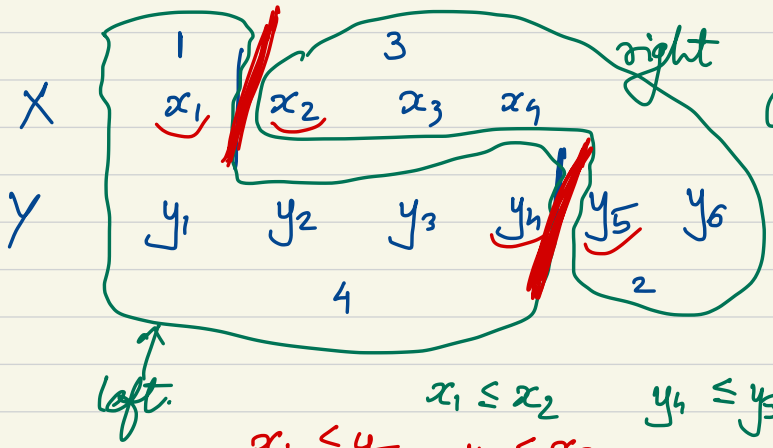
$\frac{4+5}{2} = 4.5$

Median Partitions Array: 2 Equal Halves

Brute Force. $O(m+n)$

1 2 4 5 } 1 2 3 [4] 5 6 7
3 6 7 }

median.



Goal: Partition 2 Eq Halves

All element on left ≤ all element on right

$x_1 \le x_2$ $y_4 \le y_5$ // correct partition.

$x_1 \le y_5$ $y_4 \le x_2$

Even Length / Odd length → One extra on left.

5 8 9 10
1 2 3 4 6 7

partitionX + partitionY = #elements left half = $\frac{x+y+1}{2}$

X: 1 4 | 7 10 16 (indices 0 1 | 2 3 4)

Y: 8 12 17 20 | 22 26 (indices 0 1 2 3 | 4 5)

partitionX = $\frac{lo+hi}{2} = 2$, pY = 4

$4 \le 22$ ✓ $20 \le 7$ ✗

1 4 | 7 10 16
8 12 17 20 | 22 26

Found: maxLeftX ≤ minRightY && maxLeftY ≤ minRightX

else if maxLeftX > minRightY move left e ← pX − 1

else move right s ← pX + 1

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Study Notes