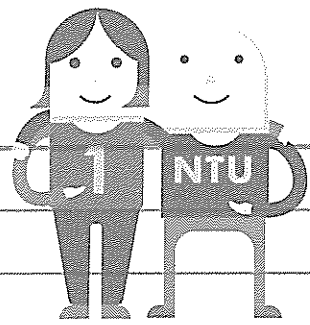


$$\frac{n}{2} \quad \frac{n}{2} + 1 \quad \frac{n}{2} + 2 \quad \frac{n}{2} + 3$$



possible num of keyCmp ($n=8$): 4, 5, 6, 7

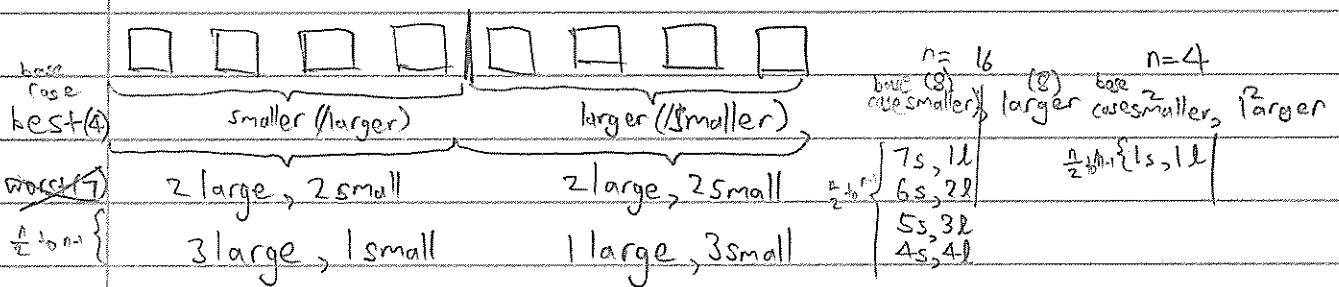
4 keyCmp

- 1 1 vs 5, 2 vs 5, 3 vs 5, 4 vs 5
- 2 5 vs 1, 5 vs 2, 5 vs 3, 5 vs 4

7 keyCmp

- 1 1 vs 2, 3 vs 2, 3 vs 4, 5 vs 4, 5 vs 6, 7 vs 6, 7 vs 8
- ...

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1 2 3 5 4 6 7 8

1 vs 4 2 vs 4 3 vs 4 5 vs 4 6 vs 4 7 vs 4 8 vs 4

1 2 3 6 4 5 7 8

2 3 7 8 1 4 5 6

2 vs 1 2 vs 4 3 vs 4 7 vs 4 7 vs 5 7 vs 6

1 4 6 7 2 3 5 8

1 vs 2 4 vs 2 4 vs 3 4 vs 5 6 vs 5 6 vs 8 7 vs 8

1 2 3 8 4 5 6 7

1 vs 4 2 vs 4 3 vs 4 8 vs 4 8 vs 5 8 vs 6 8 vs 7

1 1 7 1 1 8 / 1 1 8 1 1 7

(1 to 6) $(n-2)! \cdot 2$ $2 \cdot 6!$
 $\hookrightarrow 2(n-2)! \quad \wedge \quad [2(\frac{n}{2}-1)]! \cdot 2$

4 \rightarrow 4
 5 keyCmp \rightarrow merge 3
 6 \rightarrow 2
 7 \rightarrow 1

\hookrightarrow disproved $\frac{n}{4}$ large, $\frac{n}{4}$ small
 each subarray leads to worst

worst case:
 largest 2 elements in different subarrays