

### Problem statement

Nuts  $\downarrow n$       Bolts  $\downarrow b$

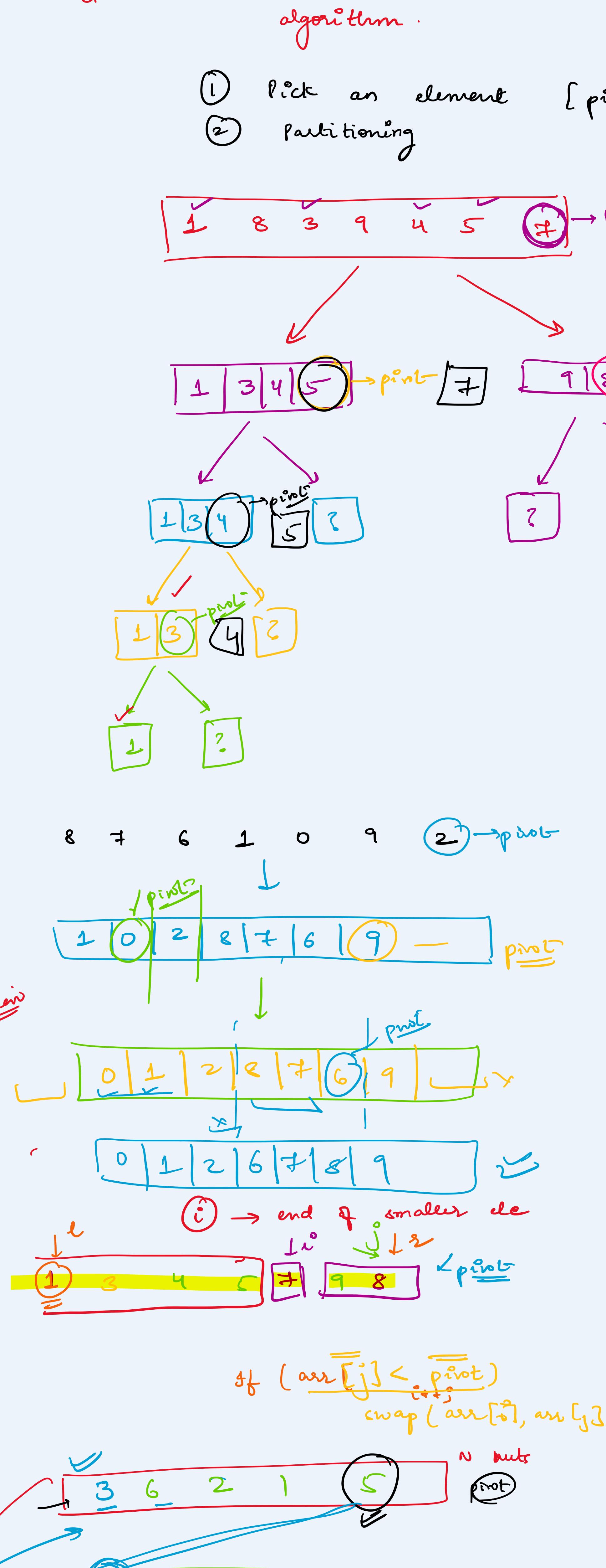
$\rightarrow$  Nut fixes into a bolt  
 $\rightarrow$  Take a nut  $N_i$  and bolt  $B_j$ .

$$\begin{aligned} \rightarrow N_i &= B_j \\ \rightarrow N_i &\subset B_j \\ \rightarrow N_i &> B_j \end{aligned}$$

Given  $N$  nuts &  $B$  bolts.  
 $\rightarrow$  Also, given, for every nut, there is a corresponding bolt.

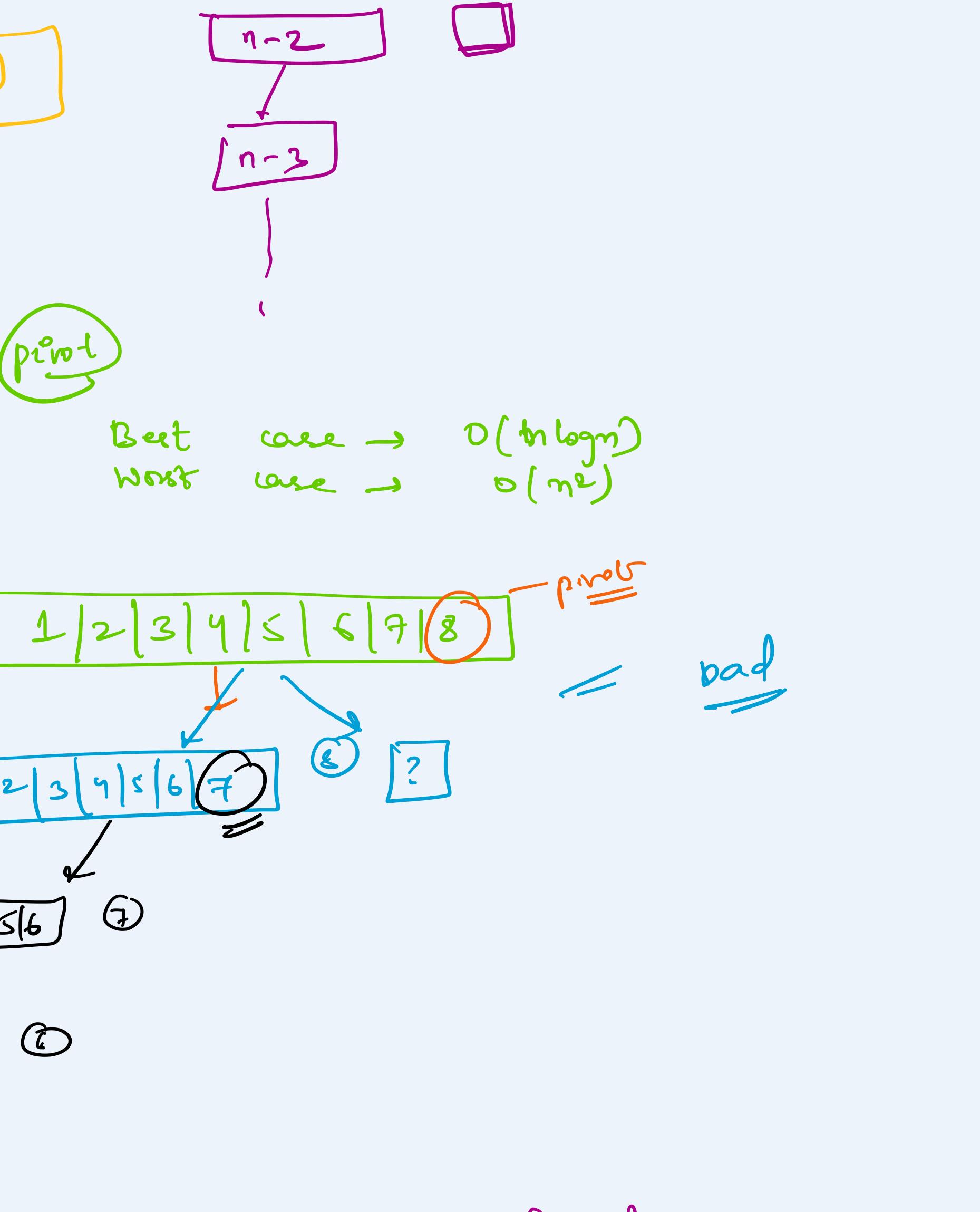
$\rightarrow$  Sort the nuts & bolts.

Using a bolt  $B_i$ , compare nuts.



Quick sort is a divide & conquer algorithm.

- ① Pick an element [pivot]
- ② Partitioning



Time complexity

- ① Best case
- ② Worst case

$T(n) = T(1) + T(n-1) + O(n)$

$T(n) = O(n^2)$

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

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