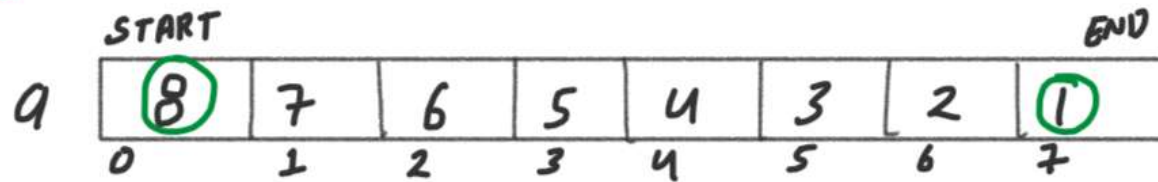


Ex = 2 DRY RUN



① start = 0    End = 7    PI = 7    i = -1    j = 0

i = -1	j = 0	8 > 1	j = 1	8	7	6	5	4	3	2	1
i = -1	j = 1	7 > 1	j = 2			"					
i = -1	j = 2	6 > 1	j = 3			"					
i = -1	j = 3	5 > 1	j = 4			"					
i = -1	j = 4	4 > 1	j = 5			"					
i = -1	j = 5	3 > 1	j = 6			"					
i = -1	j = 6	2 > 1	j = 7			"					
i = -1	j = 7 <del>X</del>										

i = 0    swap(8, 1)    ⇒    
1
7
6
5
4
3
2
8

↙ 1 at right position

	START							END
9	1	7	6	5	4	3	2	8
	0	1	2	3	4	5	6	7

②  $start = i+1 = 1$      $End = 7$      $PI = 7$      $i = 0$      $j = 1$

$i = 0$	$j = 1$	$7 < 8$	$i = 1$	$swap(7, 7)$	$j = 2$	① 7 6 5 4 3 2 8
$i = 1$	$j = 2$	$6 < 8$	$i = 2$	$swap(6, 6)$	$j = 3$	
$i = 2$	$j = 3$	$5 < 8$	$i = 3$	$swap(5, 5)$	$j = 4$	
$i = 3$	$j = 4$	$4 < 8$	$i = 4$	$swap(4, 4)$	$j = 5$	
$i = 4$	$j = 5$	$3 < 8$	$i = 5$	$swap(3, 3)$	$j = 6$	
$i = 5$	$j = 6$	$2 < 8$	$i = 6$	$swap(2, 2)$	$j = 7$	① 7 6 5 4 3 2 8
$i = 6$	$j = 7$	$\times$	$\hookrightarrow i = 7$	$swap(8, 8) \Rightarrow$	① 7 6 5 4 3 2 ⑧	$\rightarrow$ 8 at Right Index

	START					END		
9	1	7	6	5	4	3	2	8
	0	1	2	3	4	5	6	7

③  $start = 1$      $End = i - 1$   
 $\quad \quad \quad = 7 - 1$   
 $\quad \quad \quad = 6$      $P1 = 6$      $i = 0$      $j = 1$

$i = 0$	$j = 1$	$7 > 2$	$j = 2$	①	7	6	5	4	3	2	⑧	
$i = 0$	$j = 2$	$6 > 2$	$j = 3$									
$i = 0$	$j = 3$	$5 > 2$	$j = 4$									
$i = 0$	$j = 4$	$4 > 2$	$j = 5$									
$i = 0$	$j = 5$	$3 > 2$	$j = 6$									
$i = 0$	$j = 6$	$\times \rightarrow i = 1 \text{ swap}(7, 2) \Rightarrow$										
					①	2	6	5	4	3	7	⑧

2 at right position

	start			END				
9	1	2	6	5	4	3	7	8
	0	1	2	3	4	5	6	7

(4)

$$\begin{aligned} \text{start} &= i+1 \\ &= 1+1 \\ &= 2 \end{aligned} \quad \text{End} = 6 \quad \text{PI} = 6 \quad i = 1 \quad j = 2$$

$i=1$     $j=2$     $(6 < 7)$     $i=2$     $\text{swap}(6,6)$     $j=3$     $\boxed{1} \boxed{2} \ 6 \ 5 \ 4 \ 3 \ 7 \ \boxed{8}$   
 $i=2$     $j=3$     $(5 < 7)$     $i=3$     $\text{swap}(5,5)$     $j=4$   
 $j=3$     $j=4$     $(4 < 7)$     $i=4$     $\text{swap}(4,4)$     $j=5$   
 $i=4$     $j=5$     $(3 < 7)$     $i=5$     $\text{swap}(3,3)$     $j=6$   
 $i=5$     $j=6$     $\times \rightarrow i=6$     $\text{swap}(7,7) \Rightarrow \boxed{1} \boxed{2} \ 6 \ 5 \ 4 \ 3 \ \boxed{7} \boxed{8}$

7 at right position

	start			END				
9	1	2	6	5	4	3	7	8
	0	1	2	3	4	5	6	7

5

$start = 2$      $End = i - 1$      $P1 = 5$      $i = 1$      $j = 2$   
 $= 6 - 1$   
 $= 5$

$i = 1$      $j = 2$     6 > 3     $j = 3$     [1] [2] 6 5 4 3 7 8  
 $i = 1$      $j = 3$     5 > 3     $j = 4$   
 $i = 1$      $j = 4$     4 > 3     $j = 5$   
 $i = 1$      $j = 5$  ✗  $\rightarrow i = 2$     swap(6, 3)  $\Rightarrow$  [1] [2] [3] 5 4 6 [7] [8]

3 at Right position

	start			END				
9	1	2	3	5	4	6	7	8
	0	1	2	3	4	5	6	7

⑥

$$\begin{aligned} \text{start} &= i+1 \\ &= 2+1 \\ &= 3 \end{aligned} \quad \text{End} = 5 \quad \text{PI} = 5 \quad i = 2 \quad j = 3$$

$i=2$      $j=3$      $5 < 6$      $i=3$      $\text{swap}(5,5)$      $j=4$      $\boxed{1} \boxed{2} \boxed{3} \ 5 \ 4 \ 6 \ \boxed{7} \boxed{8}$   
 $i=3$      $j=4$      $4 < 6$      $i=4$      $\text{swap}(4,4)$      $j=5$     "

$i=4$      $j=5$      $\times \rightarrow i=5$      $\text{swap}(6,6) \Rightarrow \boxed{1} \boxed{2} \boxed{3} \ 5 \ 4 \ \boxed{6} \boxed{7} \boxed{8}$

← 6 at Right position

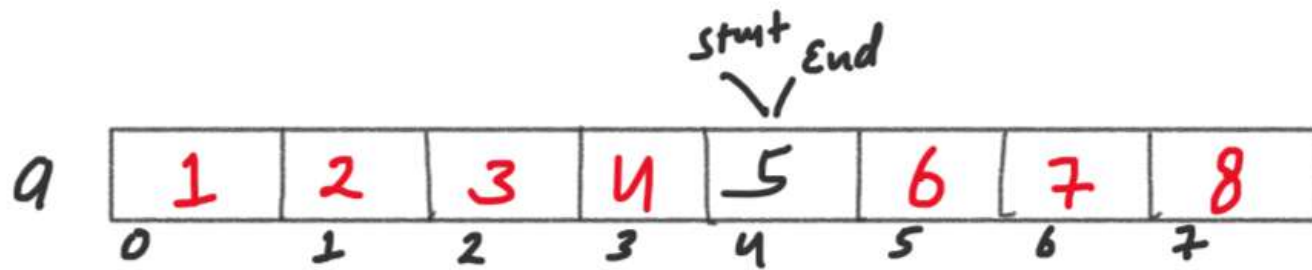
	start		END					
9	1	2	3	5	4	6	7	8
	0	1	2	3	4	5	6	7

⑦  $start = 3$      $End = i - 1$   
 $\quad\quad\quad = 5 - 1$   
 $\quad\quad\quad = 4$      $PI = 4$      $i = 2$      $j = 3$

$i = 2$      $j = 3$      $5 > 4$      $j = 4$     ① ② ③ 5 4 ⑥ ⑦ ⑧

$i = 2$      $j = 4$   $\times \rightarrow i = 3$      $swap(5, 4) \Rightarrow$  1 2 3 4 5 6 7 8  
 4 at right position

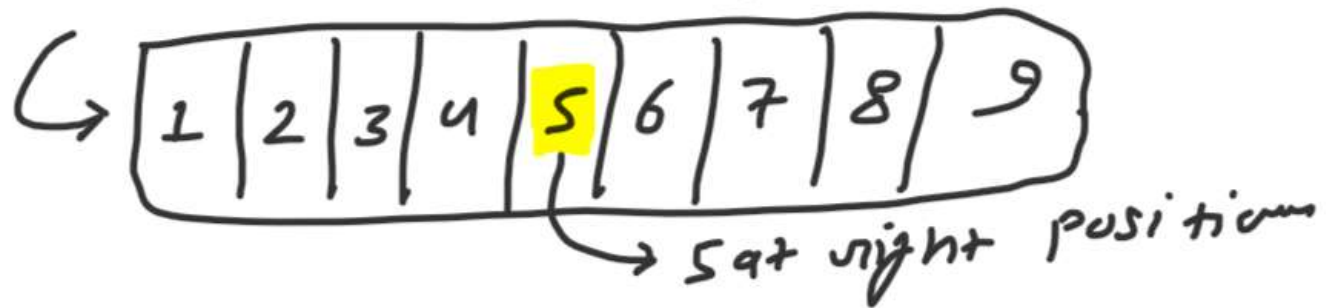




⑧

$$\begin{aligned}
 \text{start} &= i+1 \\
 &= 3+1 \\
 &= 4
 \end{aligned}
 \qquad
 \text{End} = 4
 \qquad
 PI = 4
 \qquad
 i = 3.
 \qquad
 j = 4$$

(start = End) RUK JOO ...

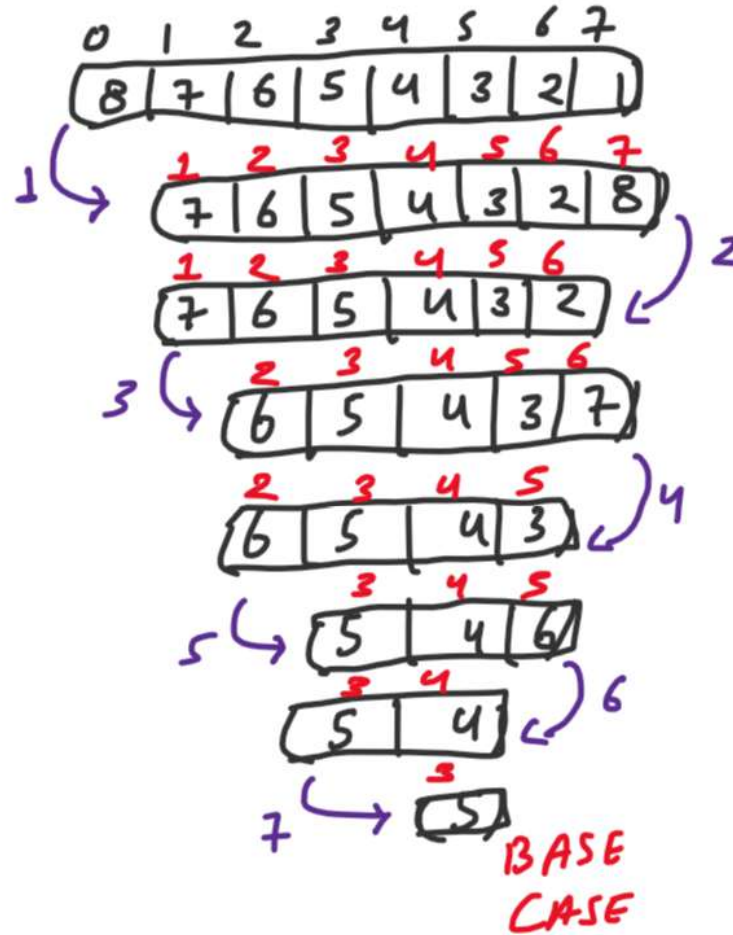




## RECURSIVE TREE

$$T.O.C = O(N)$$

$$S.O.C = O(N)$$



$$s = 0$$

$$en = 7$$

$$s = 1$$

$$en = 7$$

$$s = 1$$

$$en = 6$$

$$s = 2$$

$$en = 6$$

$$s = 2$$

$$en = 5$$

$$s = 3$$

$$en = 5$$

$$s = 3$$

$$en = 4$$

$$s = 3$$

$$en = 3$$

$(s \geq en)$  BASE CASE