Quick Sort

TestLeaf
Always Ahead

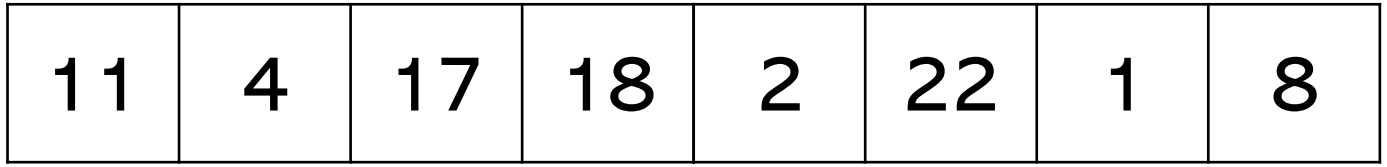
- Find an item in a sorted item [List or Array or String]
- Highly efficient in terms of time complexity against Linear Search
- Run time Complexity : O(log n)
- Based on divide and conquer technique

Example

Sort the given array

11	4	17	18	2	22	1	8

Partitioning



Step 1) Get the pivot (left most)

Step 2) Set 2 Pointers : left -> 0 , right -> length - 1

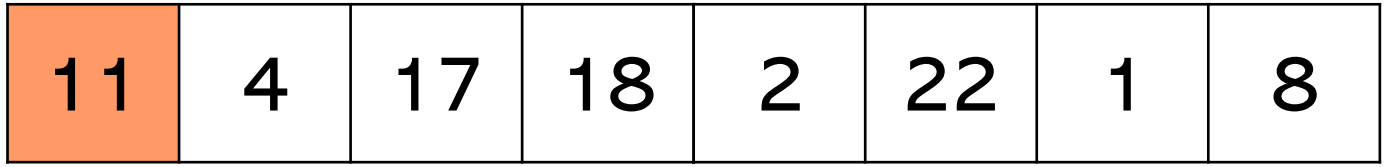
Step 3) Increment left until you find that number >= pivot

Step 4) Decrement right until you find that number <= pivot

Step 5) Swap the value of left with right

Step 6) Continue until left >= right

Partitioning



Pivot = 11

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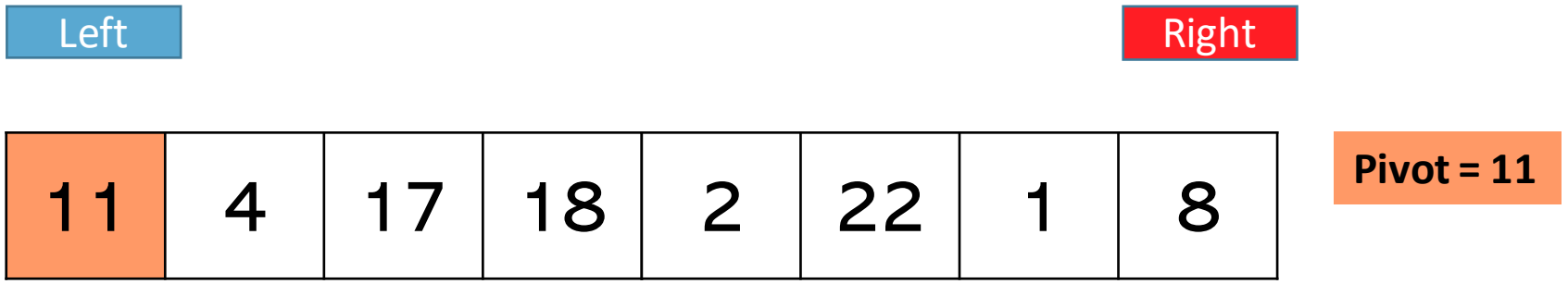

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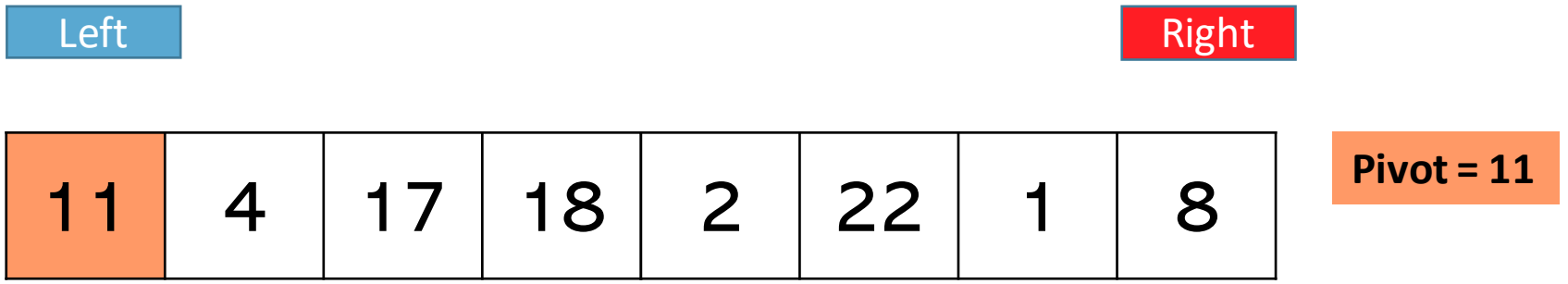

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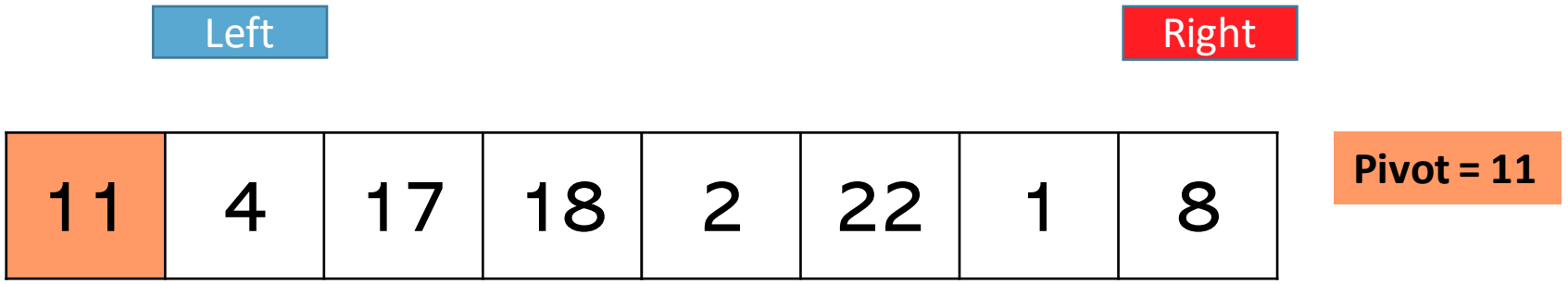

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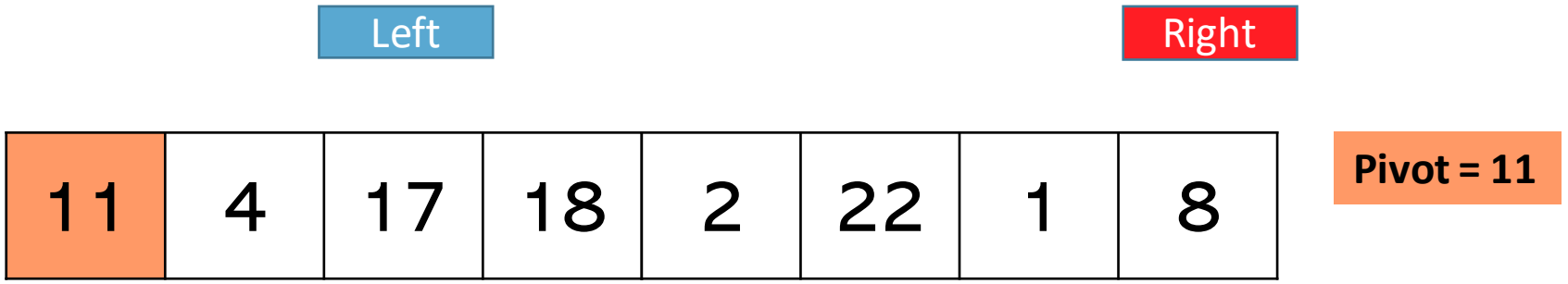

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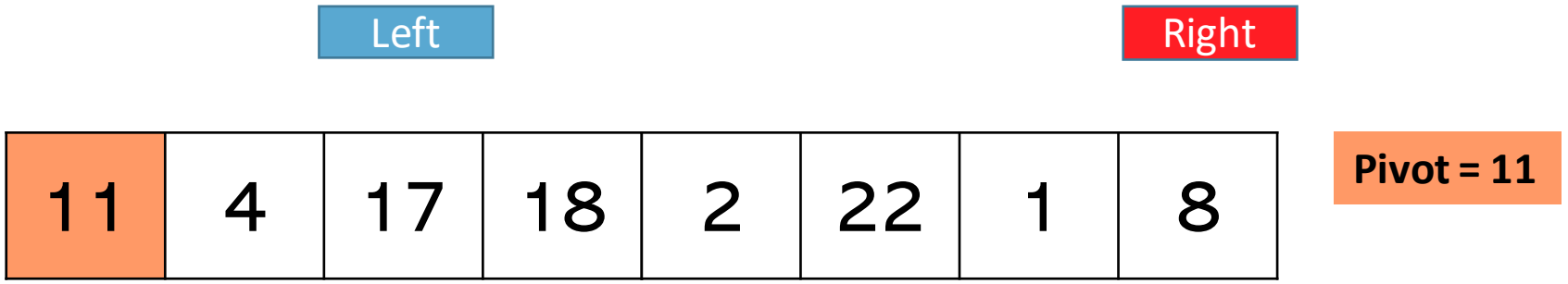

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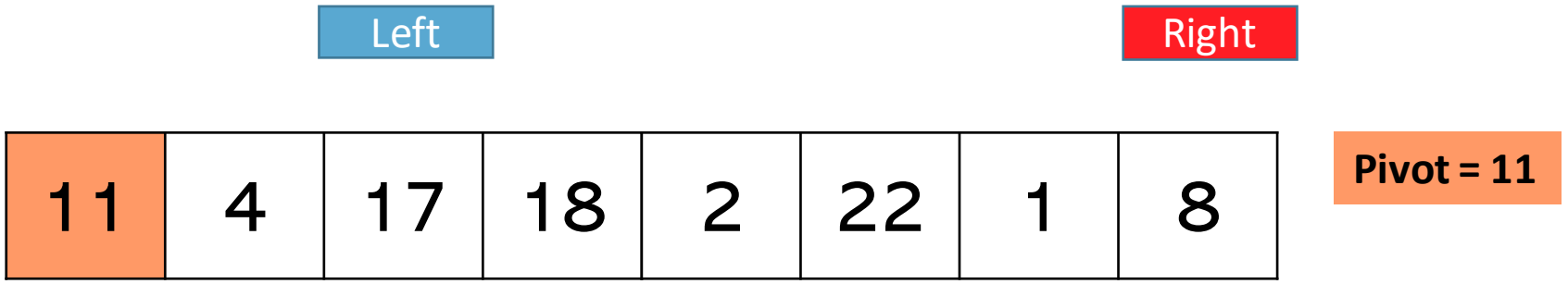

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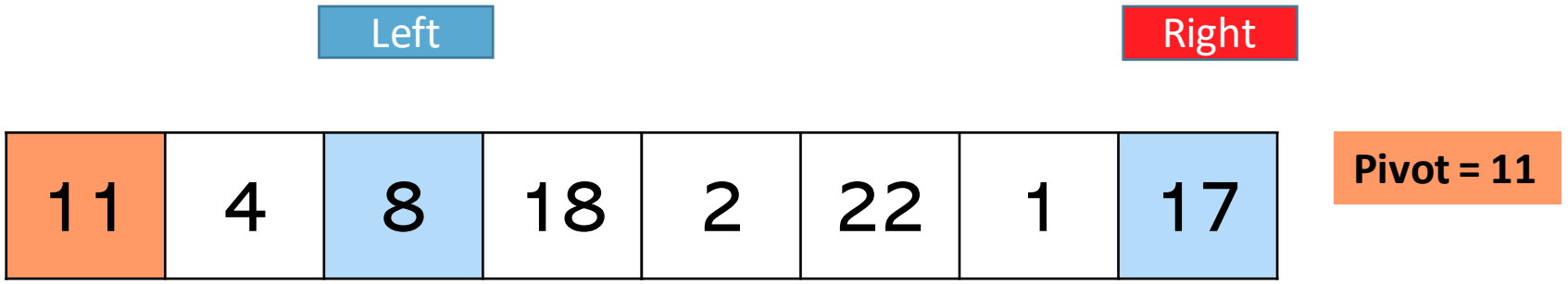

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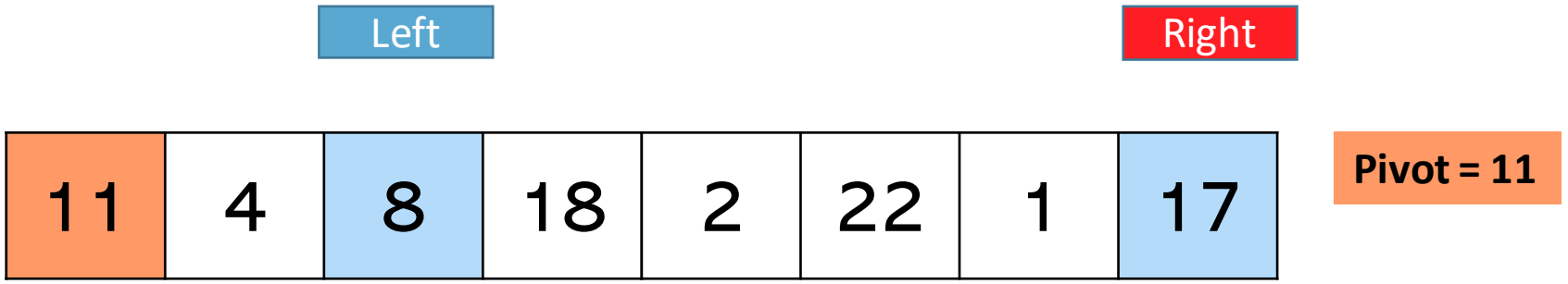

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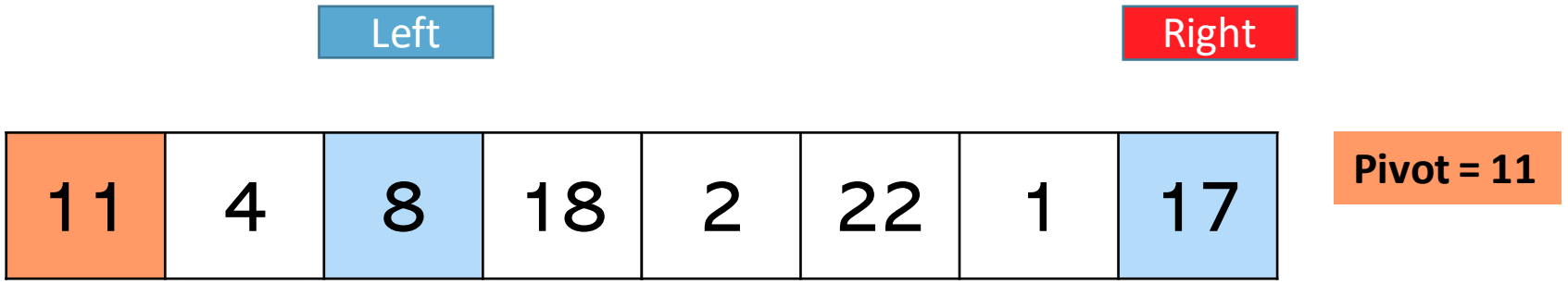

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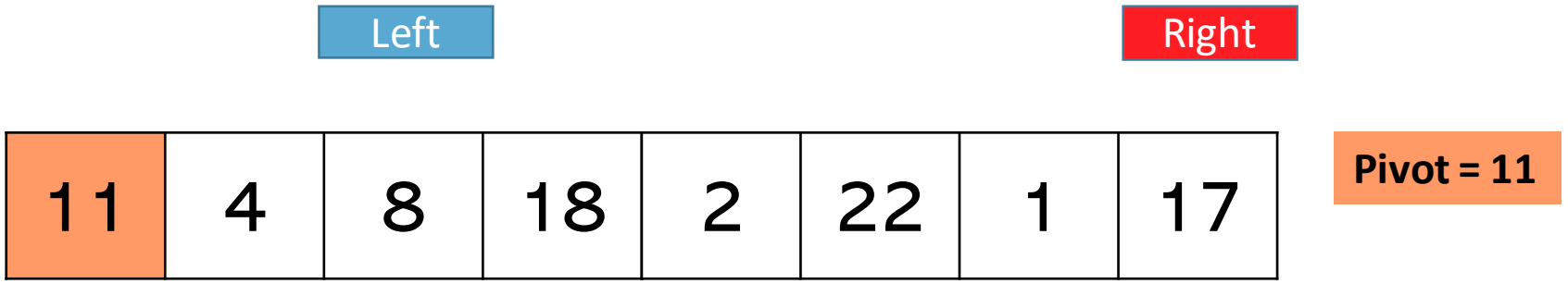

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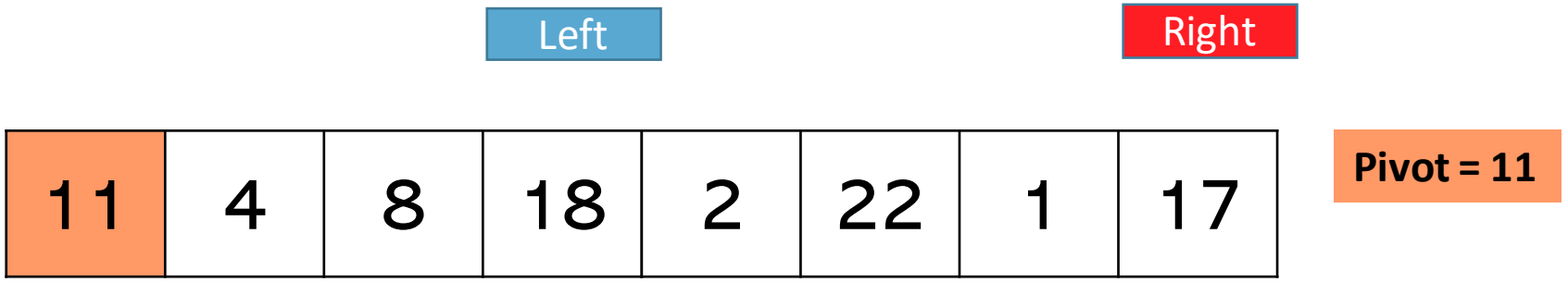

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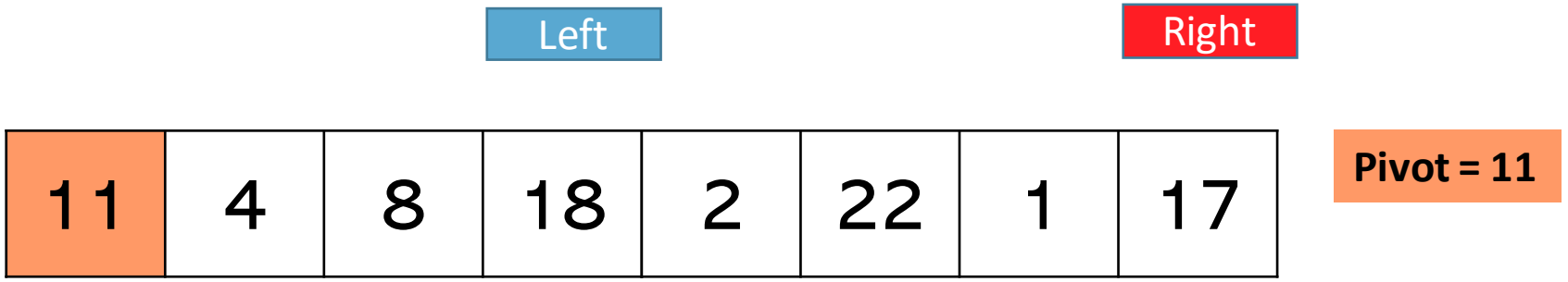

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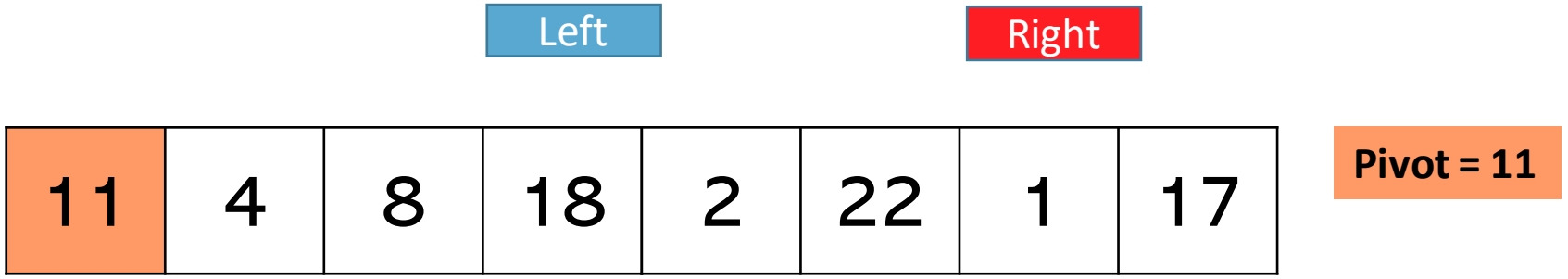

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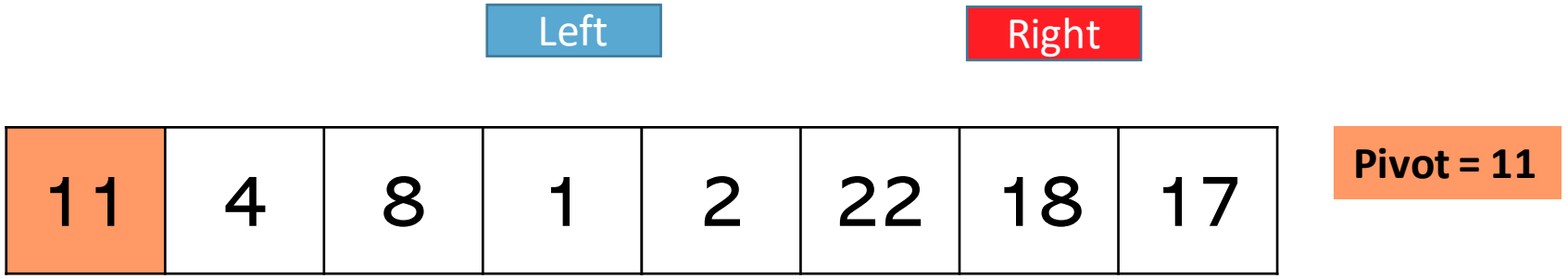

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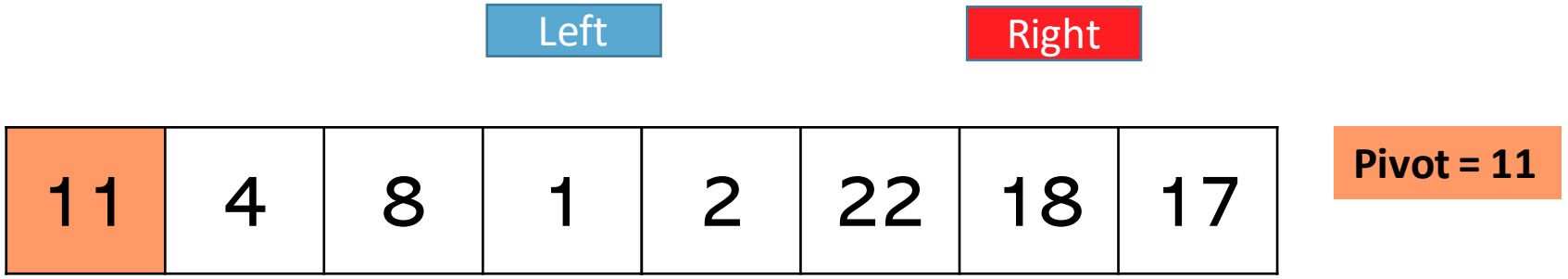

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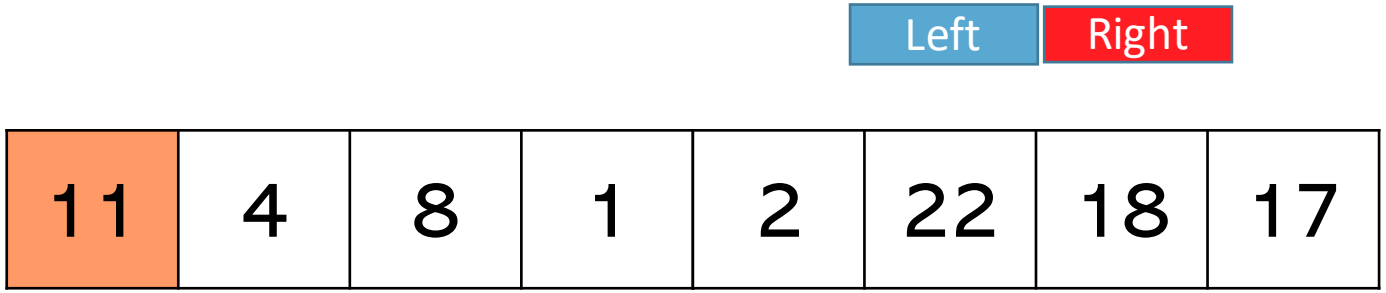

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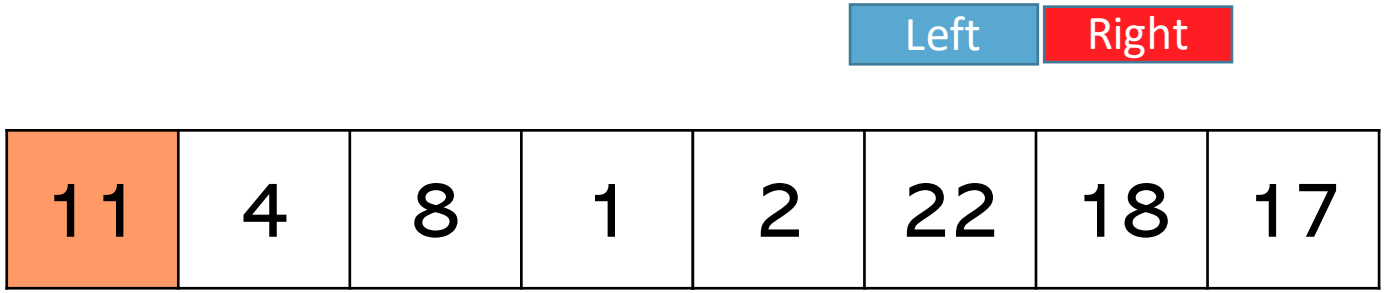

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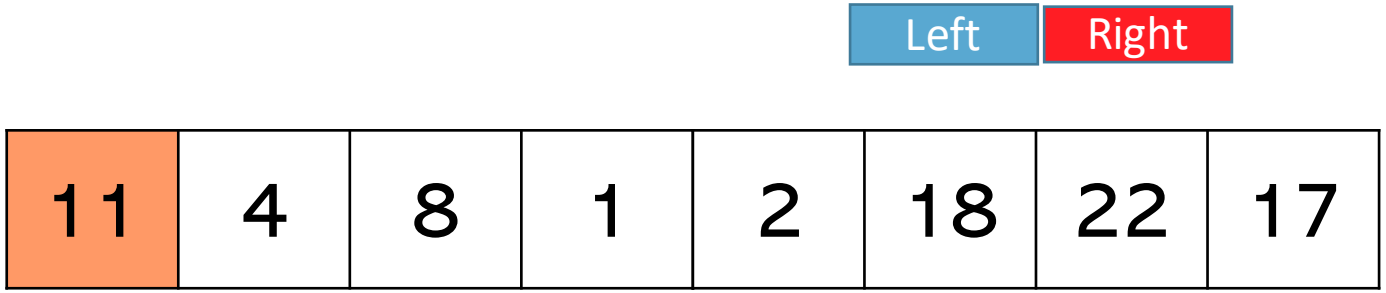

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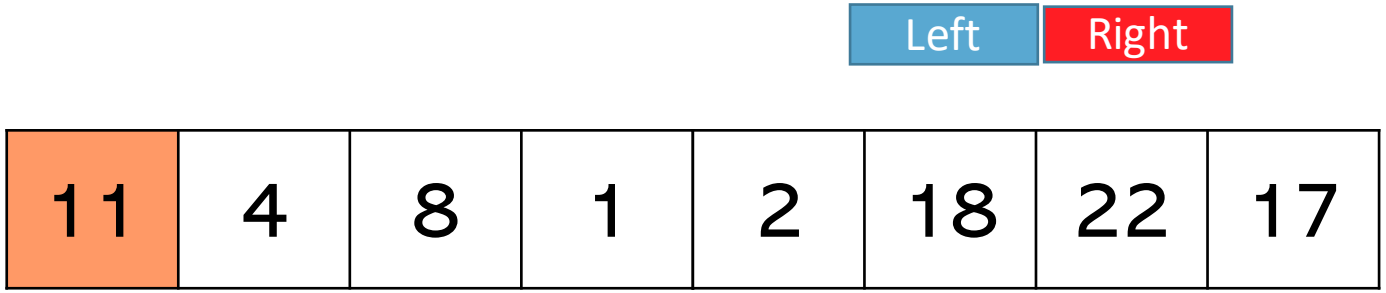

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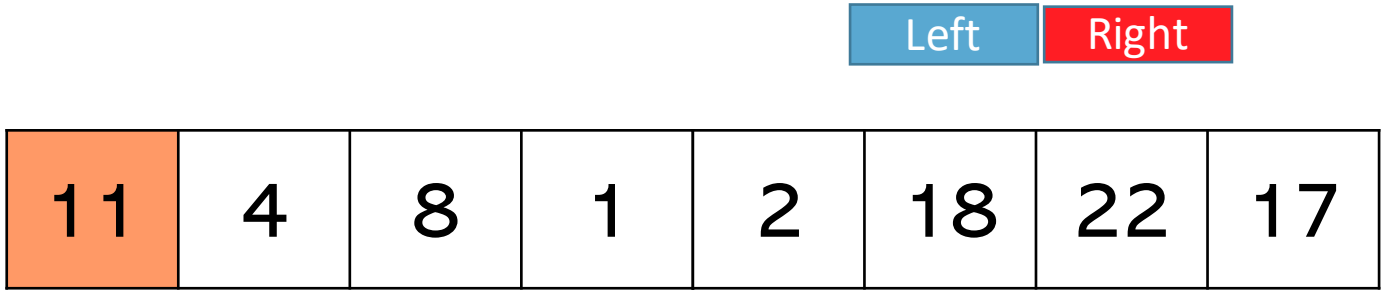

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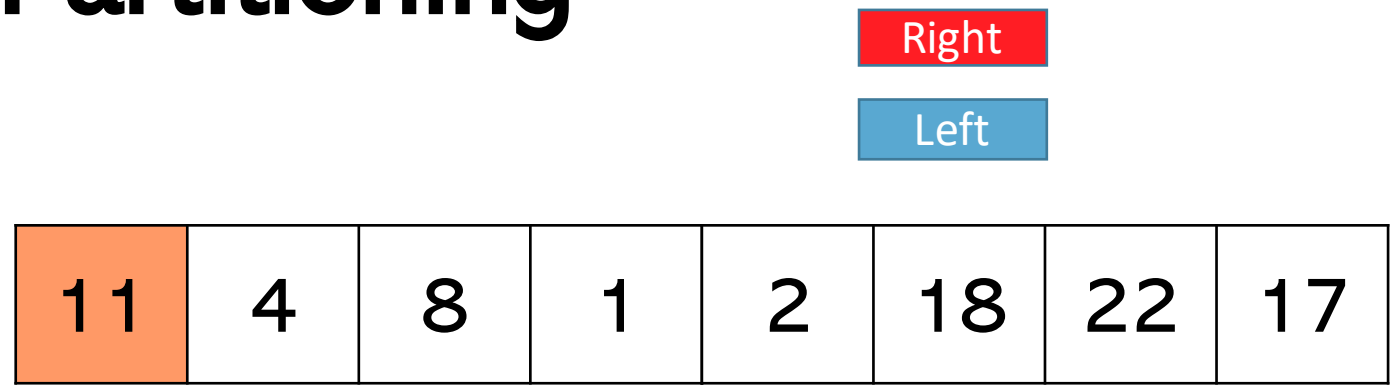

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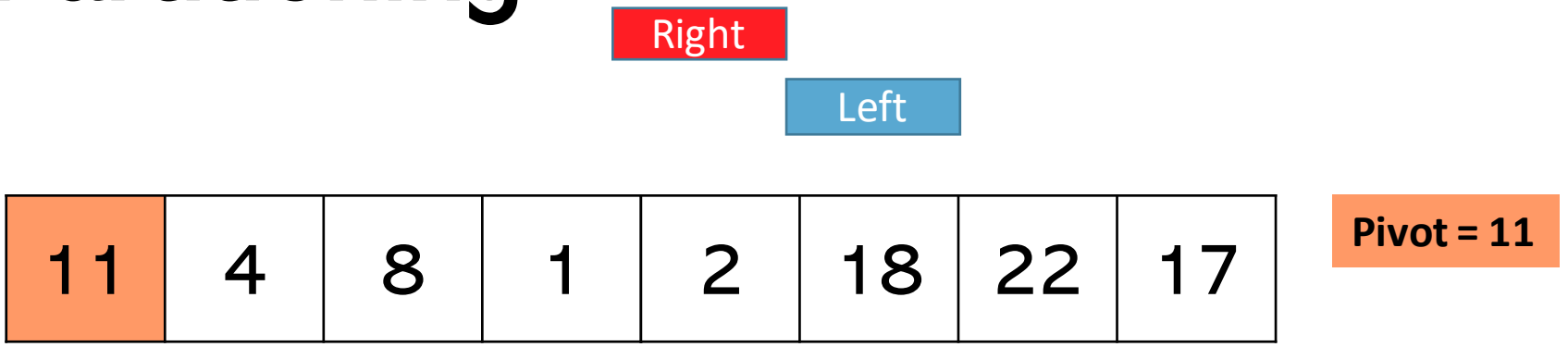

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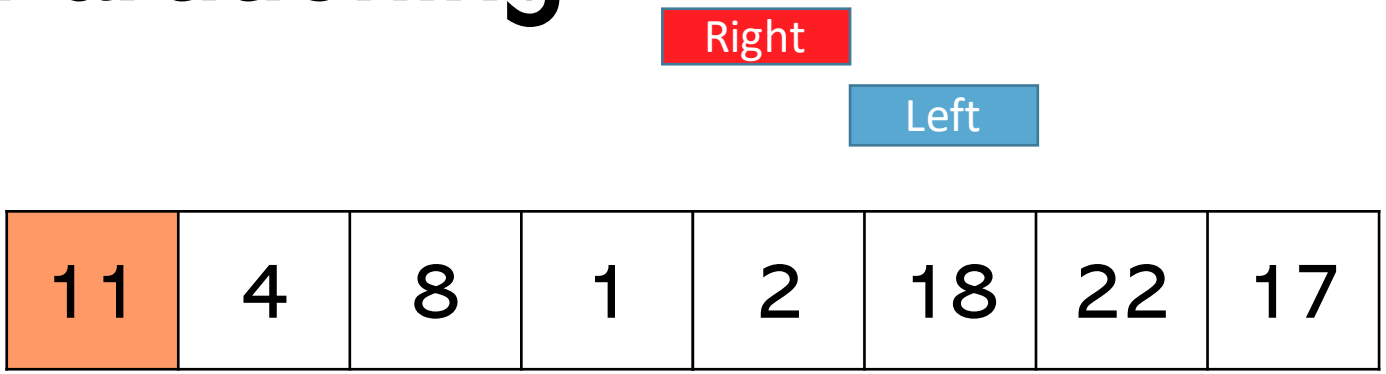

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right < left -----> hence the loop has to break

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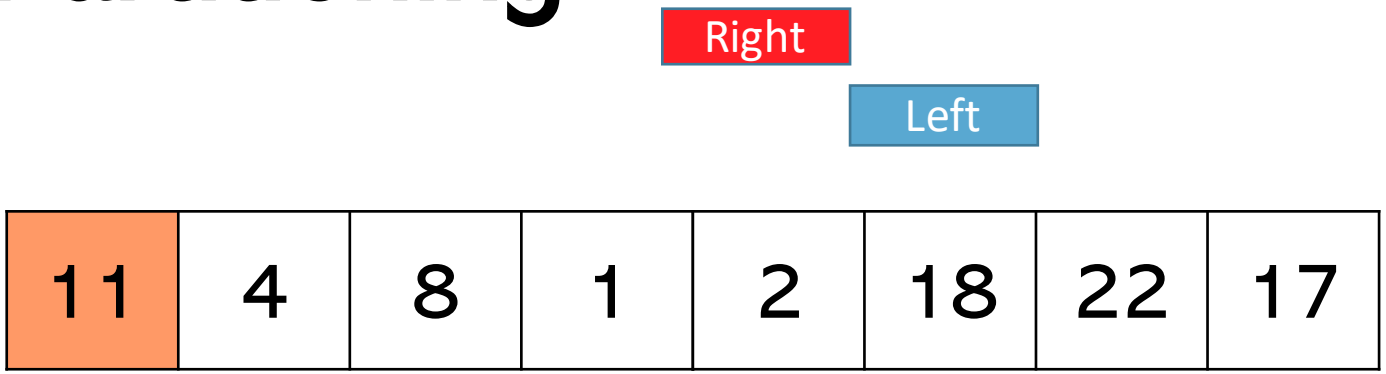
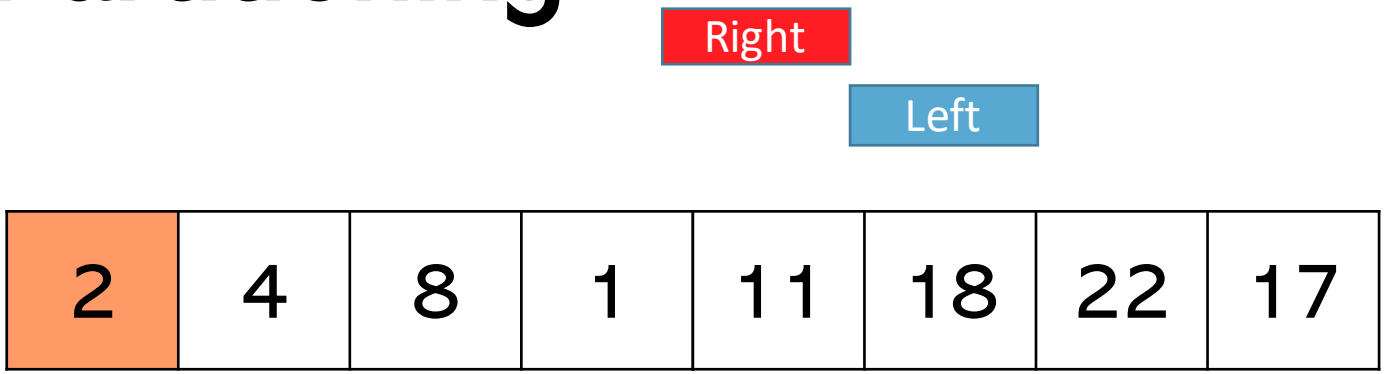


Step 7) Swap the value of pivot with right

Partitioning



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Now, we found partitioning position :: All left side has smaller and all right has bigger

Recursion on left

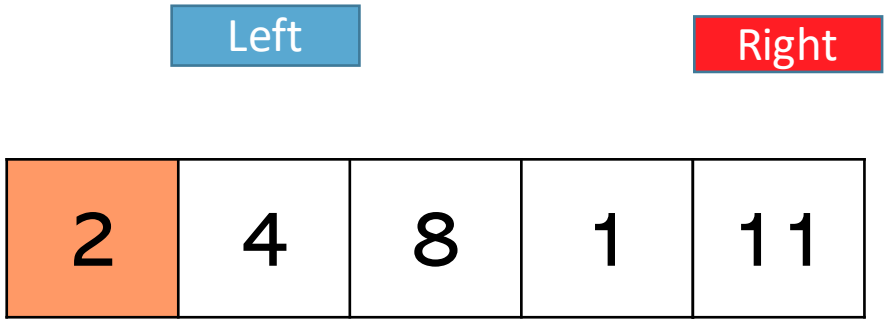
Left

Right

2	4	8	1	11

Pivot = 2

Recursion on left



Pivot = 2

Recursion on left

Left

Right

2	4	8	1	11

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Recursion on left

Left

Right

2	1	8	4	11

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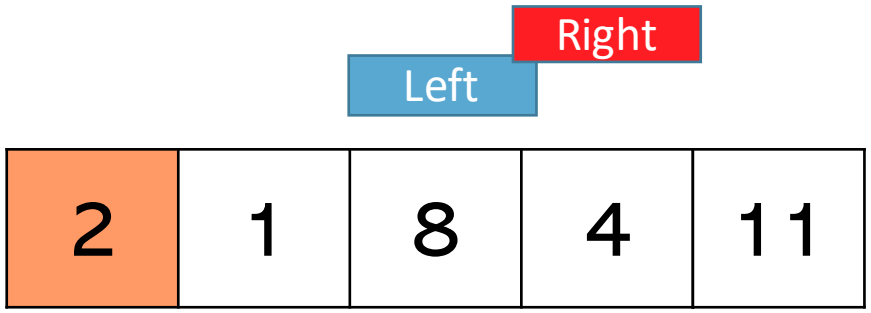
Recursion on left



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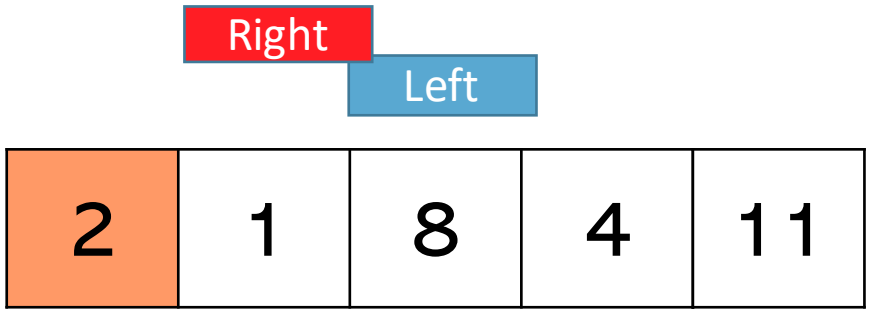

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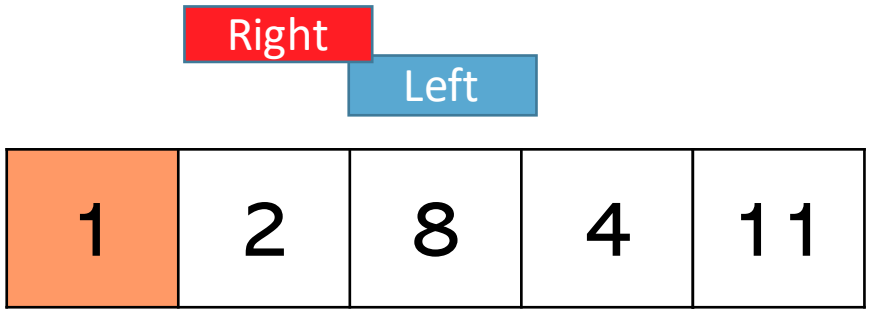
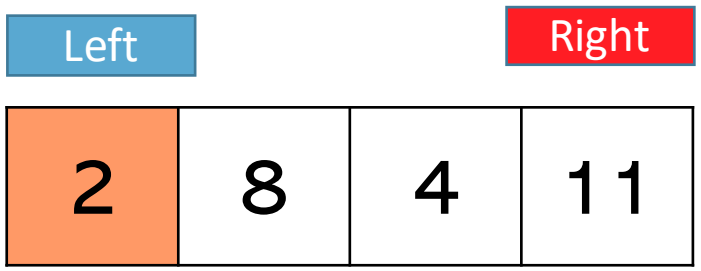


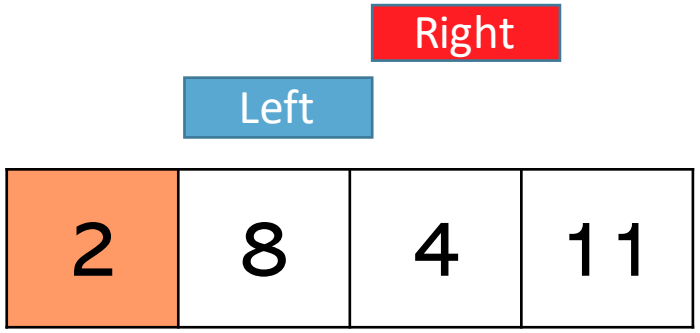
Pivot = 1

Recursion on right



Pivot = 2

Recursion on right



Pivot = 2

Recursion on right

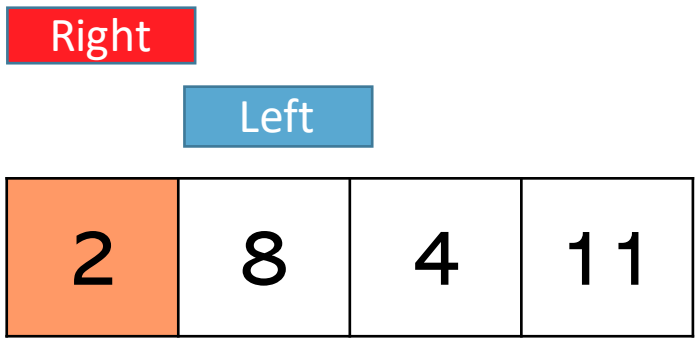
Right

Left

2	8	4	11

Pivot = 2

Recursion on right



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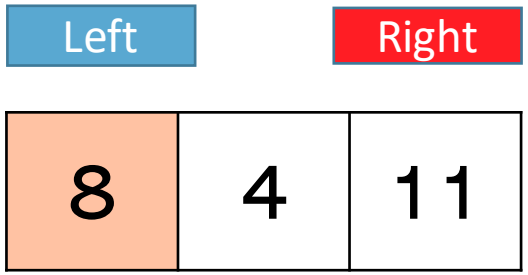
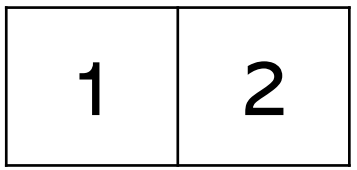
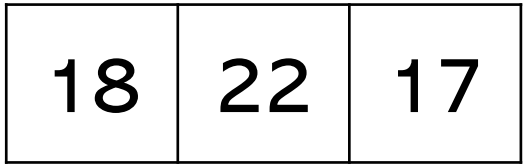
Recursion on right



Pivot = 8





Recursion on right

Left

Right

8	4	11

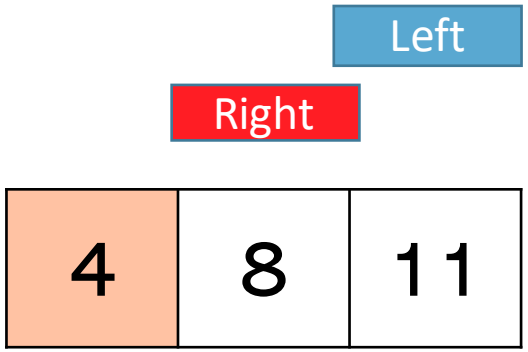
Pivot = 8

1	2

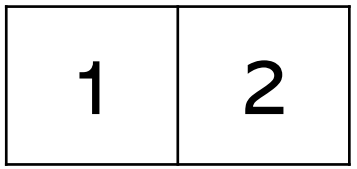
18	22	17

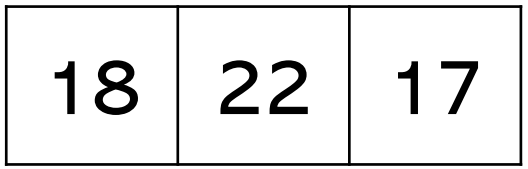
Recursion on right

Recursion on right

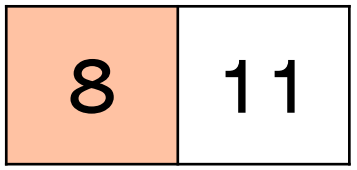


Pivot = 8





Recursion on right



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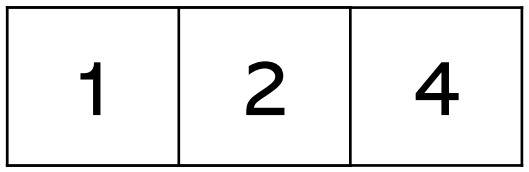
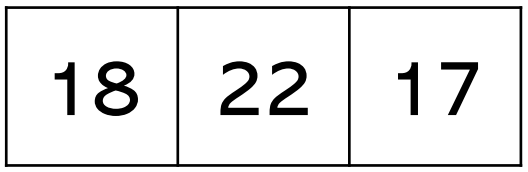
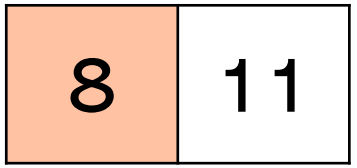




Recursion on right

Left

Right



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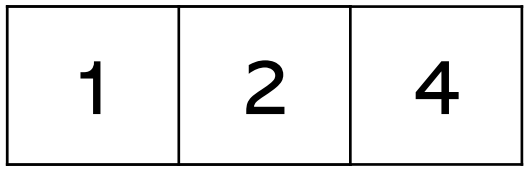
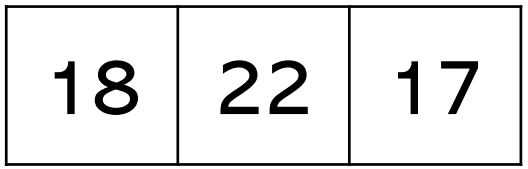
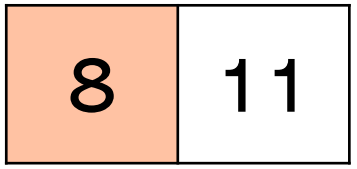




Recursion on right

Left

Right



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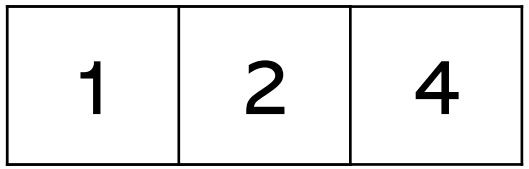
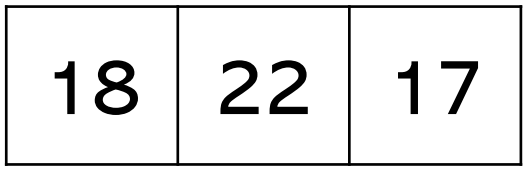
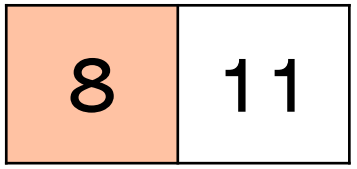




Recursion on right

Left

Right



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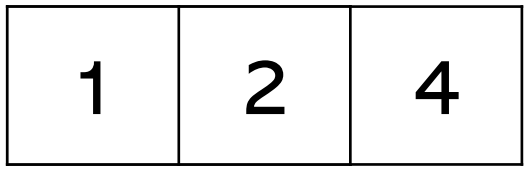
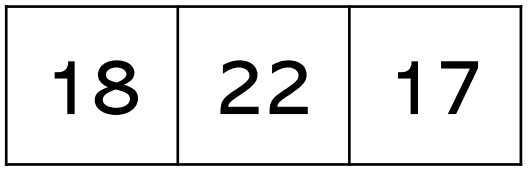




Recursion on right

Left

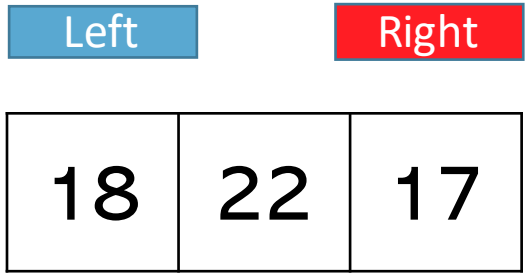
Right

Pivot = 8

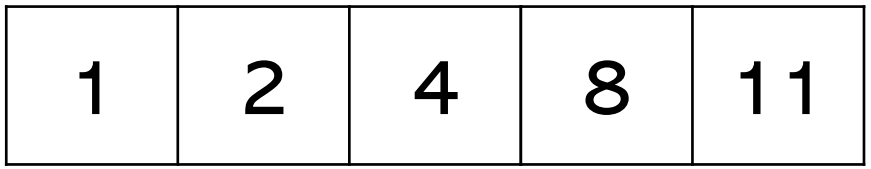
1	2	4	8	11

18	22	17

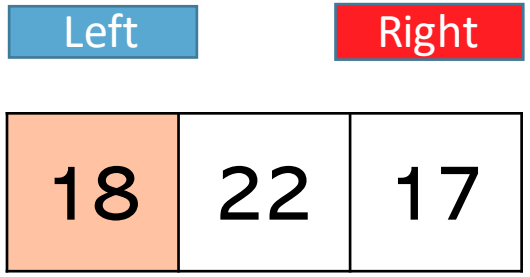
Recursion on right



Pivot = 18



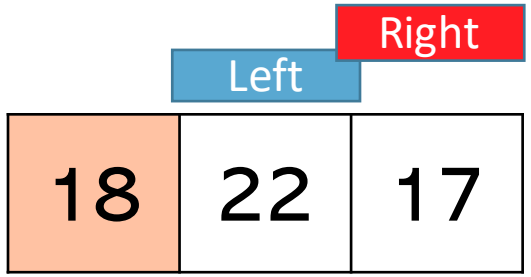
Recursion on right



Pivot = 18

1	2	4	8	11

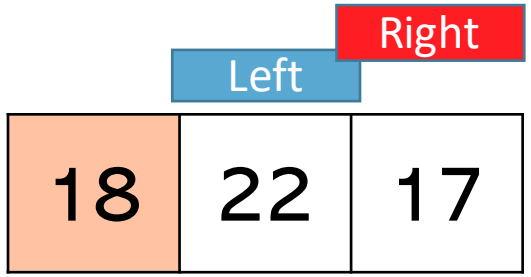
Recursion on right



Pivot = 18

1	2	4	8	11

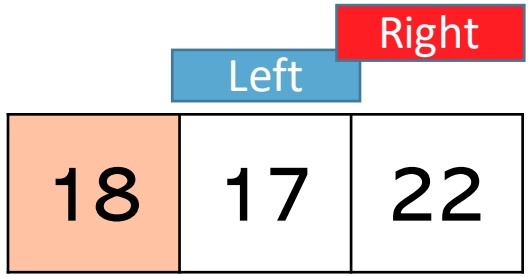
Recursion on right



Pivot = 18

1	2	4	8	11

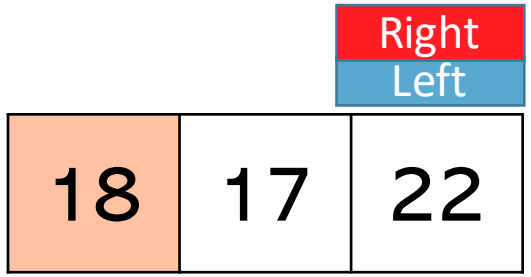
Recursion on right



Pivot = 18

1	2	4	8	11

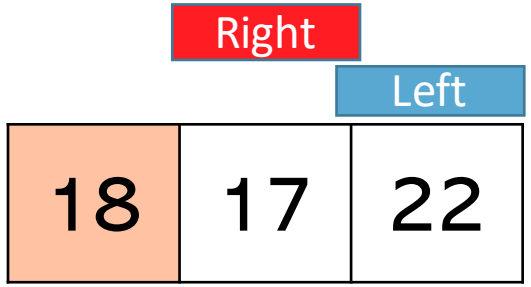
Recursion on right



Pivot = 18

1	2	4	8	11

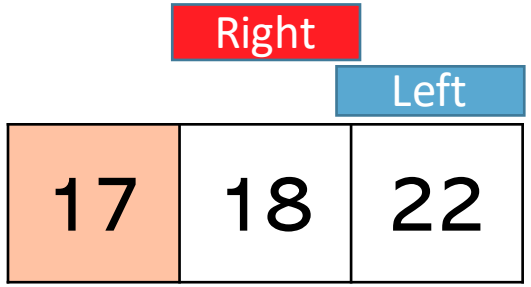
Recursion on right



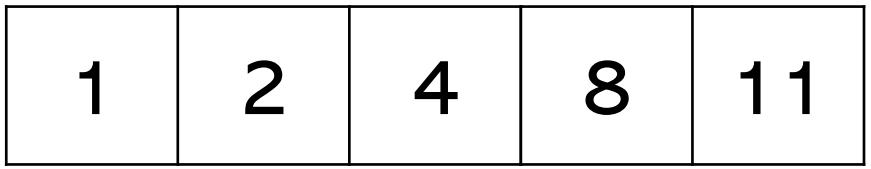
Pivot = 18

1	2	4	8	11

Recursion on right



Pivot = 18



Recursion on right

Right

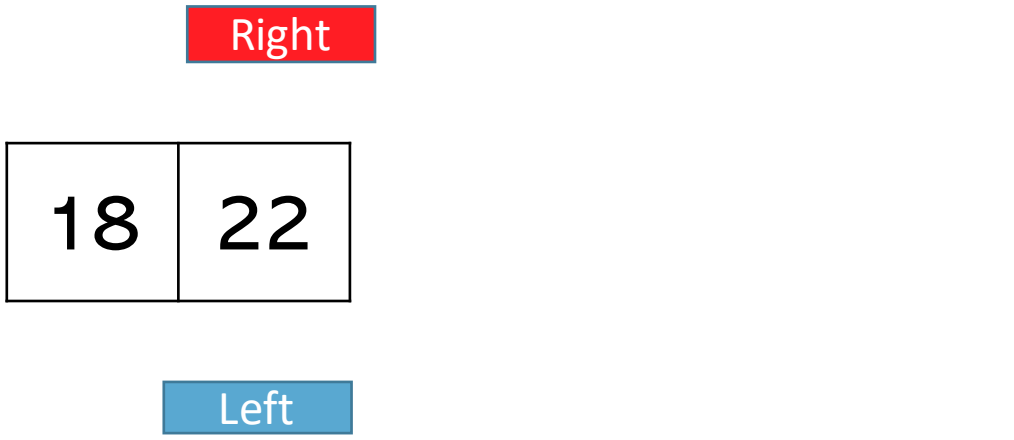
18	22

Left

Pivot = 18

1	2	4	8	11	17

Recursion on right



Recursion on right

Right

18	22

Left

Pivot = 18

1	2	4	8	11	17

Recursion on right

Right

18	22

Left

Pivot = 18

1	2	4	8	11	17

Recursion on right