

// Muhammad Ammar

// BSCS-F19-M-63

⑤ Arr : [ 19, 10, 12, 7, 25, 32, 9, 45, 11, 5, 15 ]

Solution

According to the Algorithm of Quick-Sort,

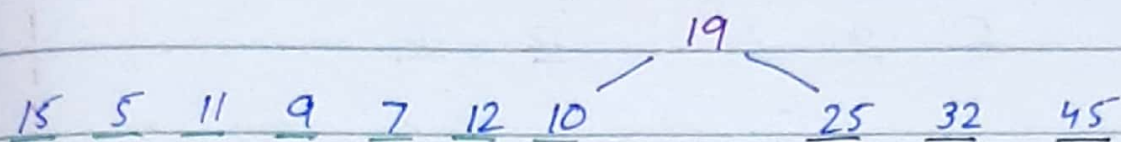
- We'll select a pivot (1<sup>st</sup> Elem)
- Place all the element to the Right or left, if they are Larger or Smaller than the pivot respectively in the Array / Sub-Array.

Now, Let us <sup>sort</sup> solve the given Array by

Quick-Sort step-by-step

↳ Step # 1

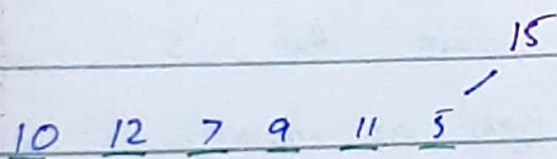
Pivot : 19



In the Array : [19, 10, 12, 7, 25, 32, 9, 45, 11, 5, 15],  
We selected '19' as pivot, and placed  
all the shorter elements to the left and  
higher elements to the Right as shown.

↳ Step # 2 - Going Left Sub-Array

Pivot : 15

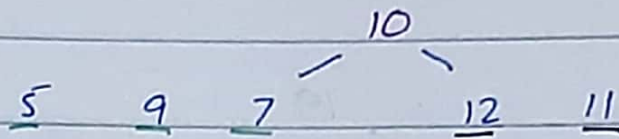


Since, all the elements were smaller than  
15, so all are gone towards the Left.



L, Step # 3 - Going Left

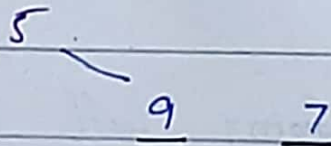
Pivot: 10



Elements have arranged according to the algorithm to both sides as shown.

L, Step # 4 - Going Left

Pivot: 5



Since, both elements were higher than the '5', so, they have gone towards right as shown.

↳ Step # 5 -

Going Right

Pivot : 9

Since, '7' was lesser than '9', so  
it has gone to the left.

7 / 9

↳ Step # 6 -

Going Right of Step # 3

Pivot : 12

Just as the previous step, '10'  
has gone to left of pivot.

10 / 12

↳ Step # 7 - Merge

Since, the left sub-array of Pivot : 19, has  
been reached to '1' element, we'll merge  
the corresponding arrays, as shown in  
the End of this Question.



↳ <sup>8.</sup> Going Right of Step # 1

Pivot : 25

Since, all the elements 25  
32    45  
were higher than pivot,  
so, they have gone towards the Right.

↳ Step # 9 - Going Right of Step # 8

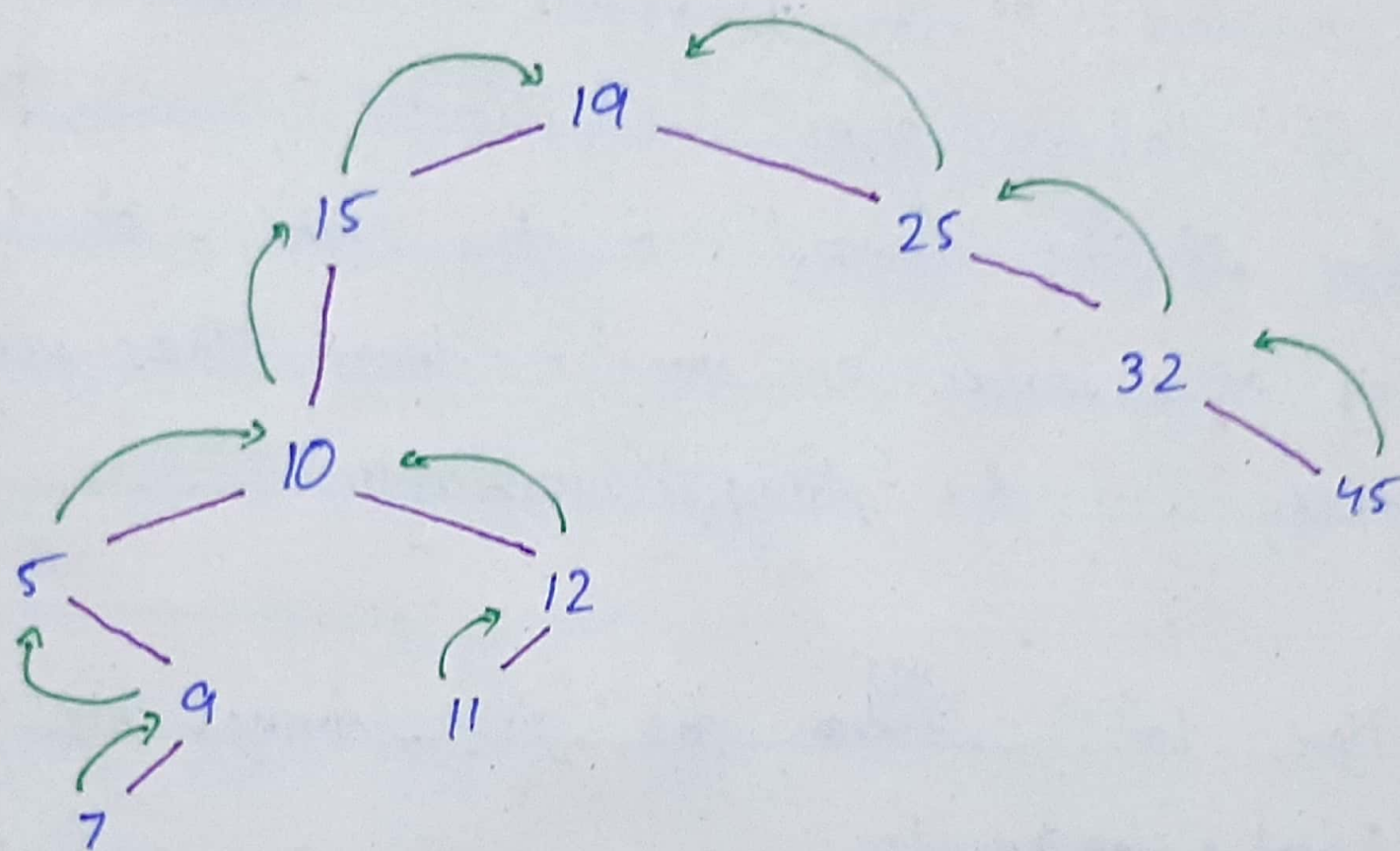
Pivot : 32

Since, '45' is higher than 32  
45  
pivot, so it has gone to Right.

↳ Step # 10 - Merge

Since, the both sides of Pivot : 19 of  
'Arr' have reached to the minimum  
element, it's the time to merge  
them.

Merging will be done from Bottom-Up,  
and Left-Right as Green Arrows suggest.



Arr = { 7, 9, 5, 10, 11, 12, 15, 19, 25, 32, 45 }