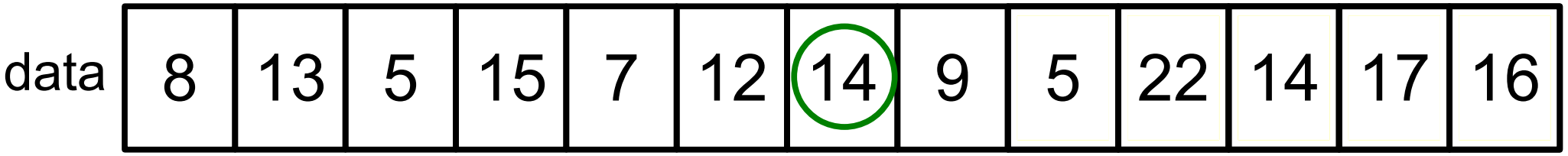
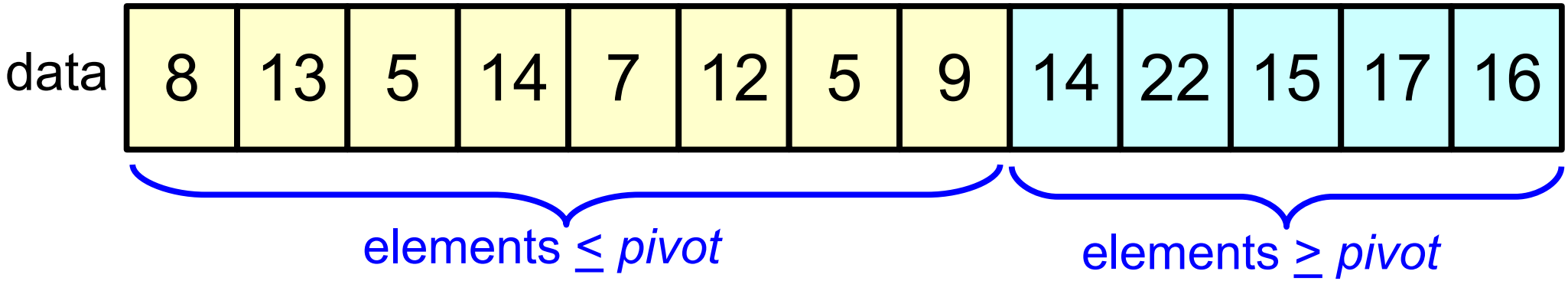
Quicksort

Choose a *pivot* element



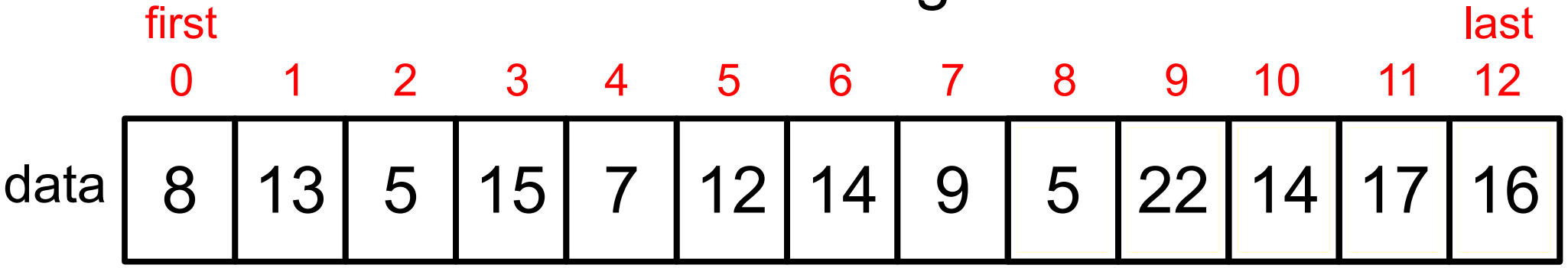
Rearrange the elements into two partitions



...and repeat for the partitions

Partitioning Algorithm

Partitioning



choose a *pivot* element
initialize left and right indices i and j
loop:
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    if indices have met or crossed, quit the loop
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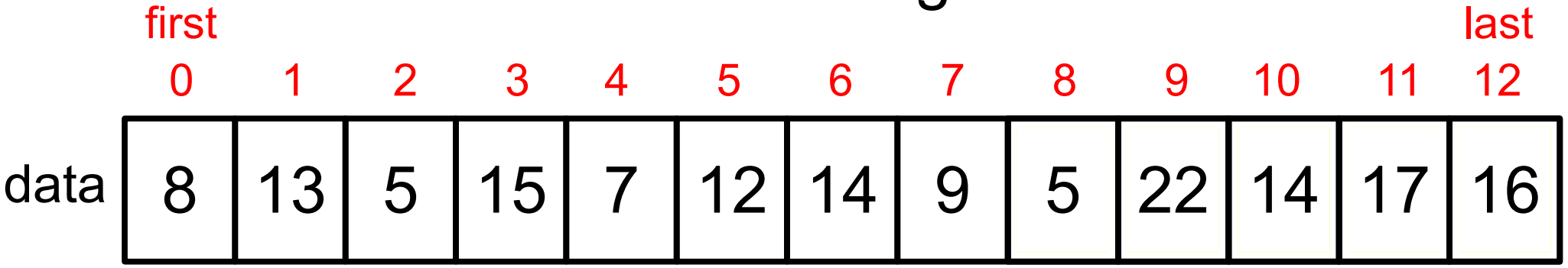
return j as the midpoint position of the partition

Partitioning



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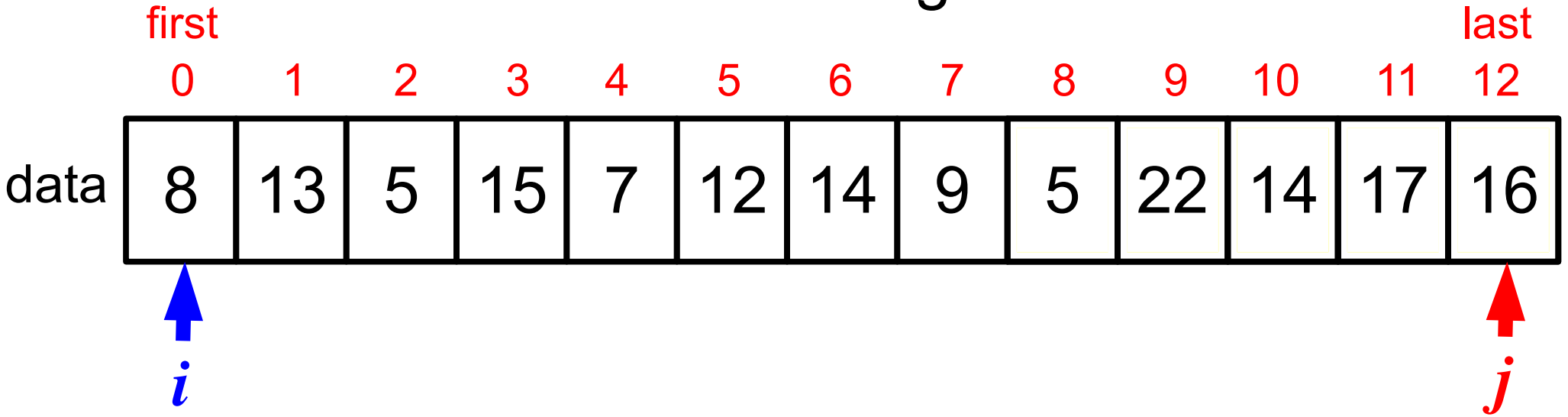
pivot element = 14

Partitioning



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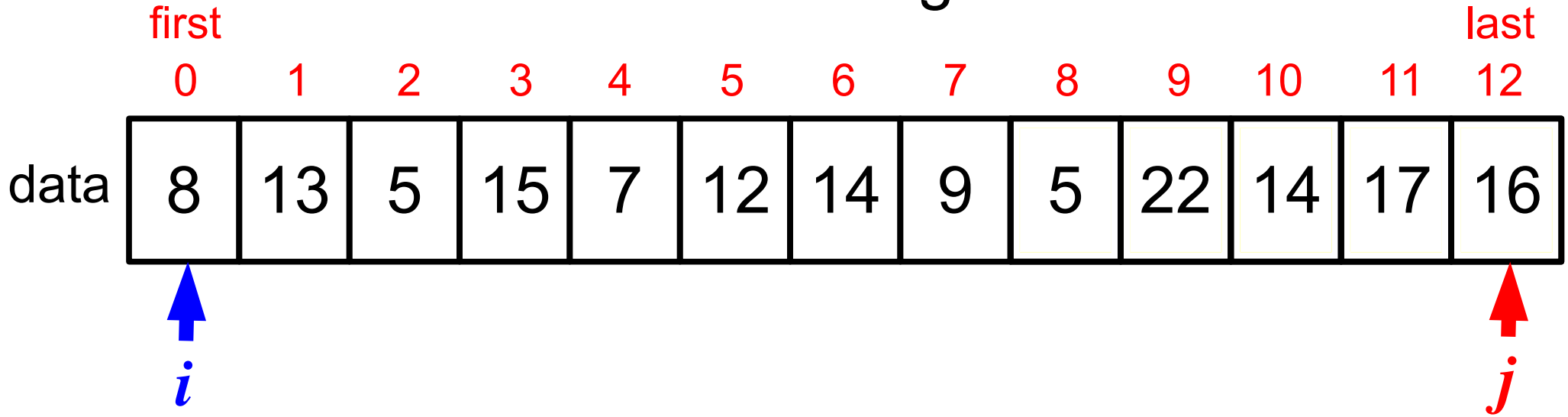

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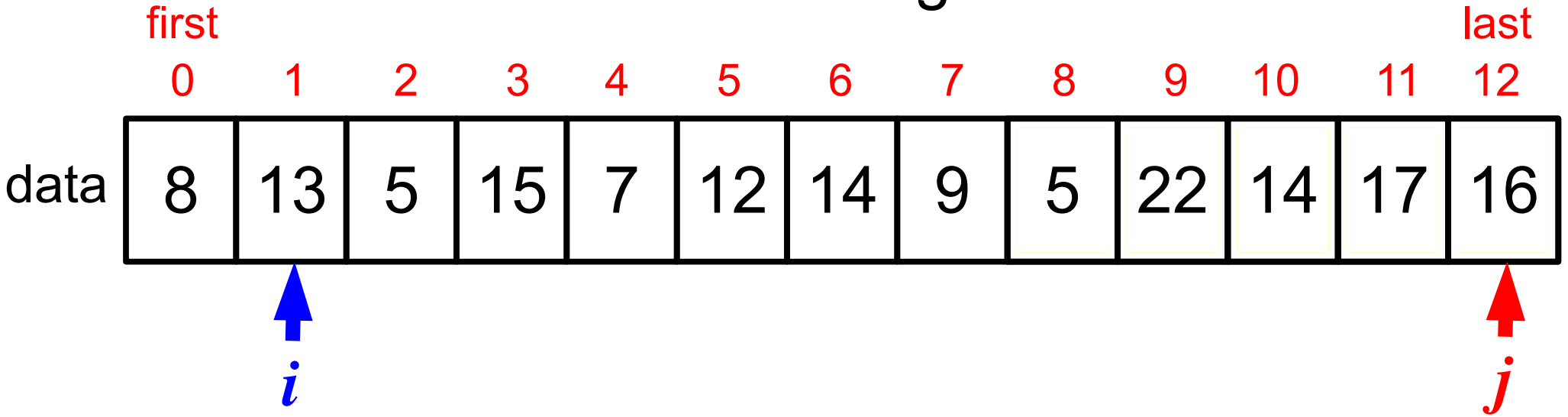

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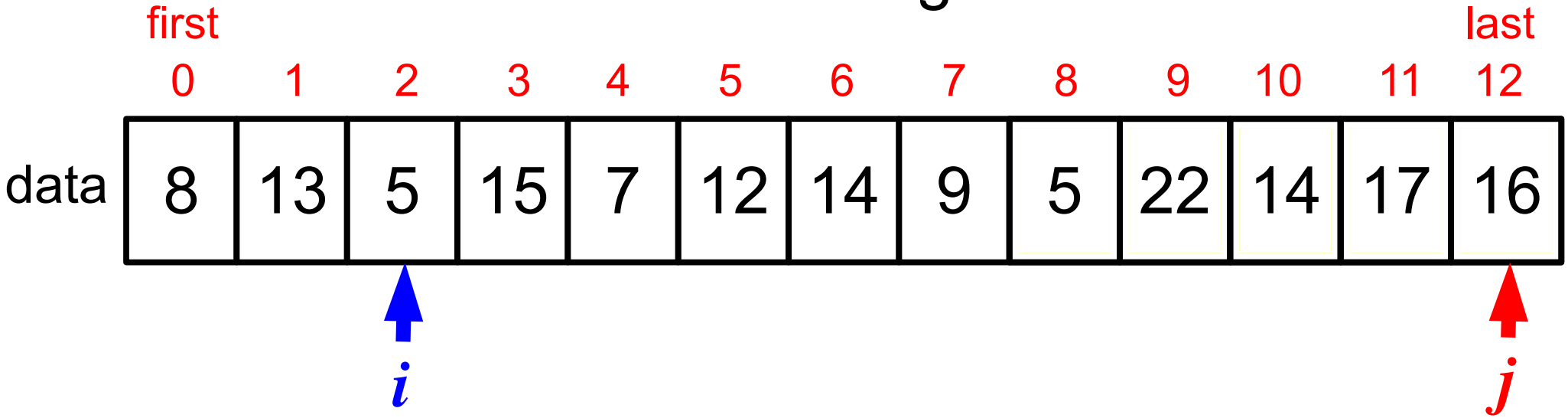

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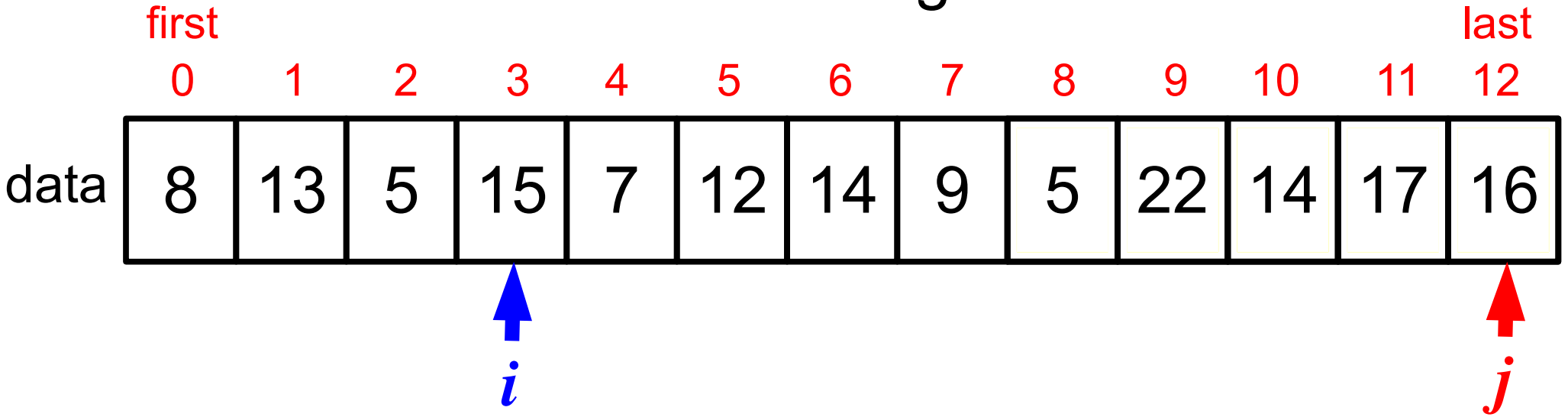

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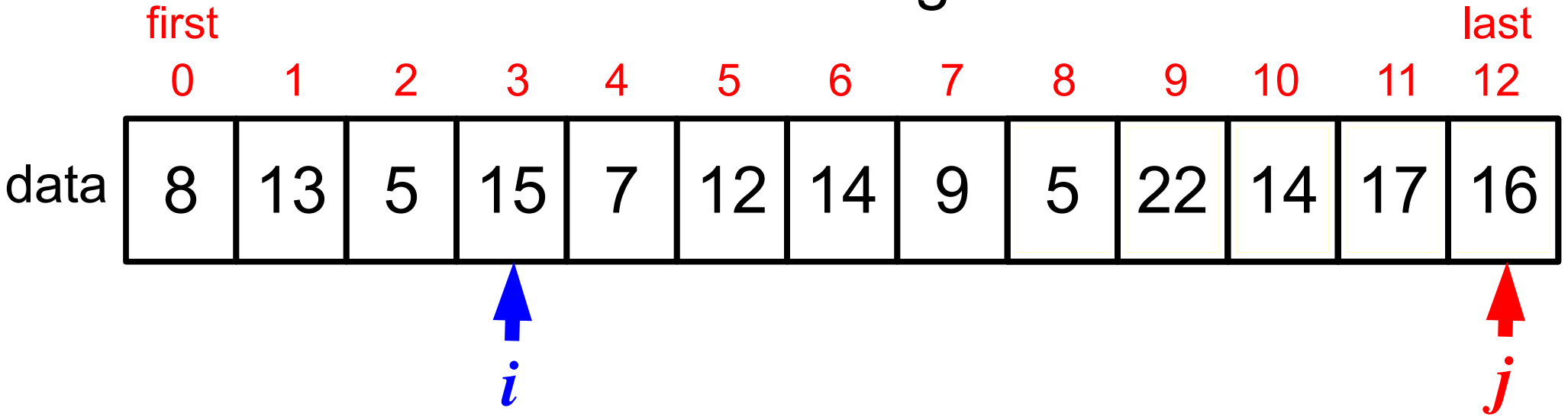

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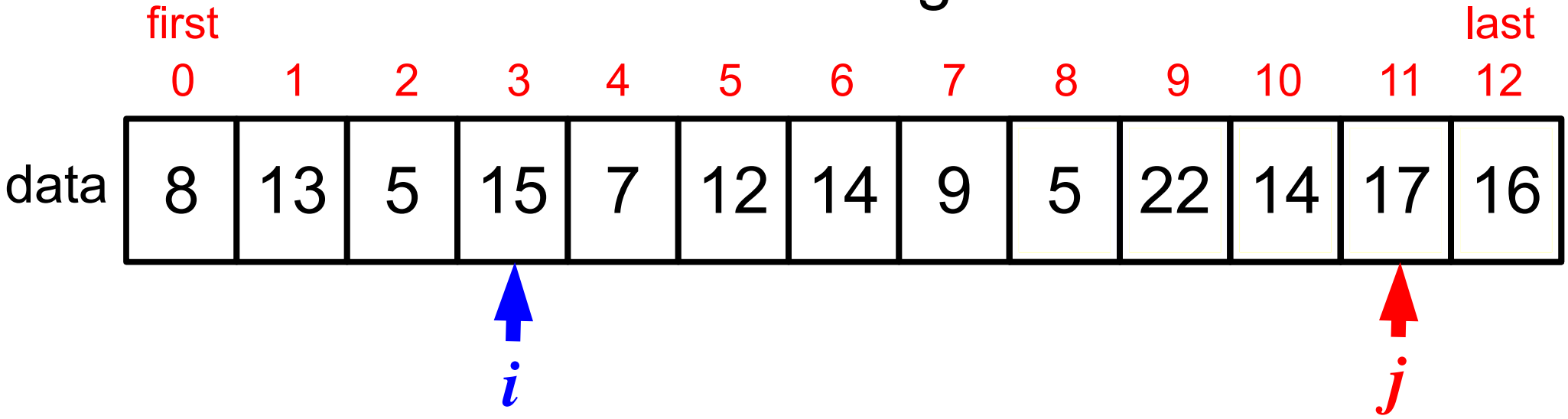

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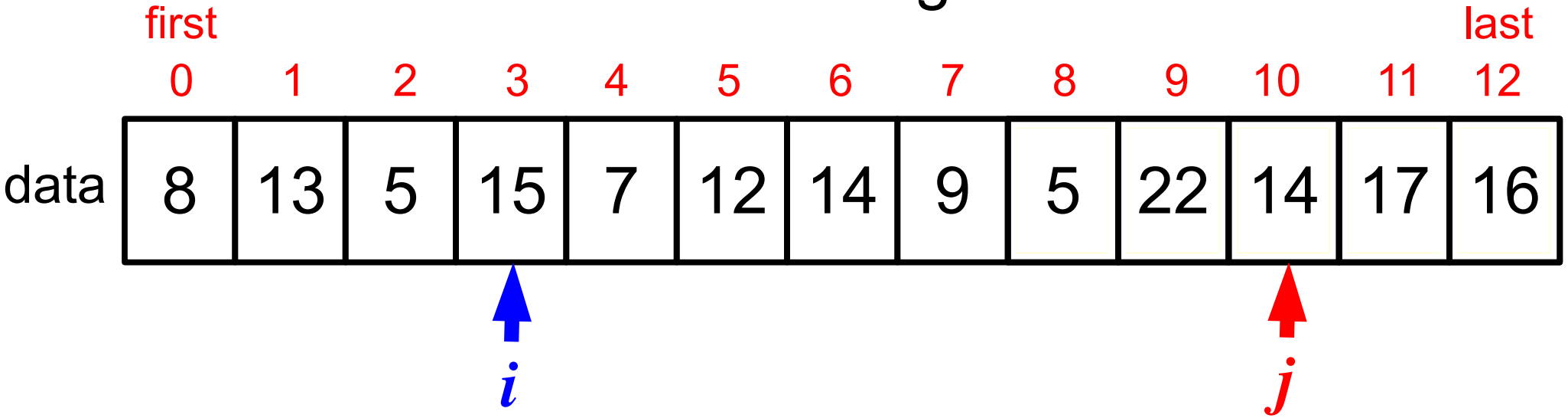

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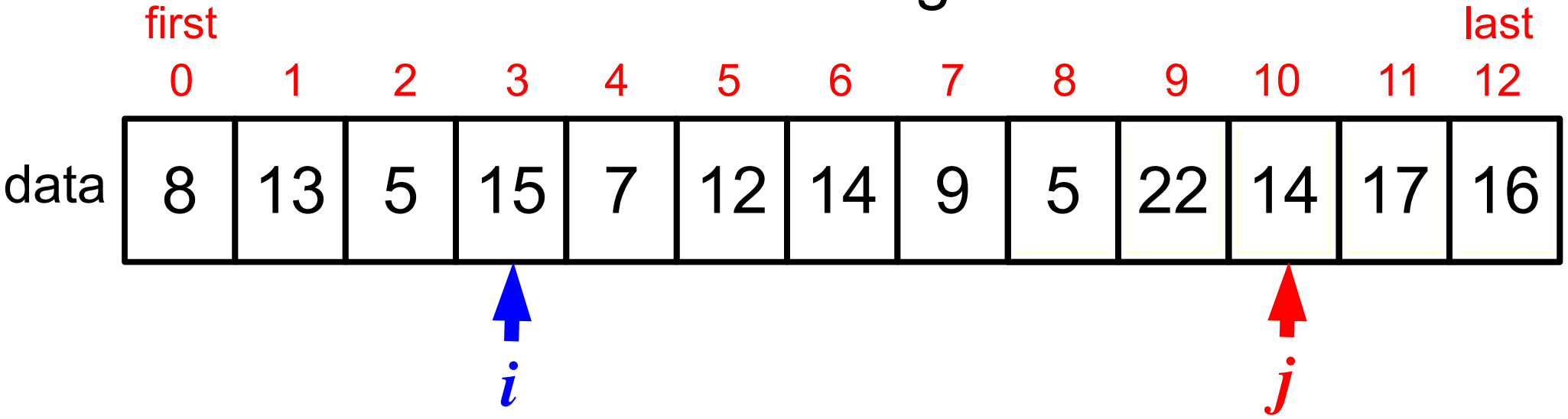

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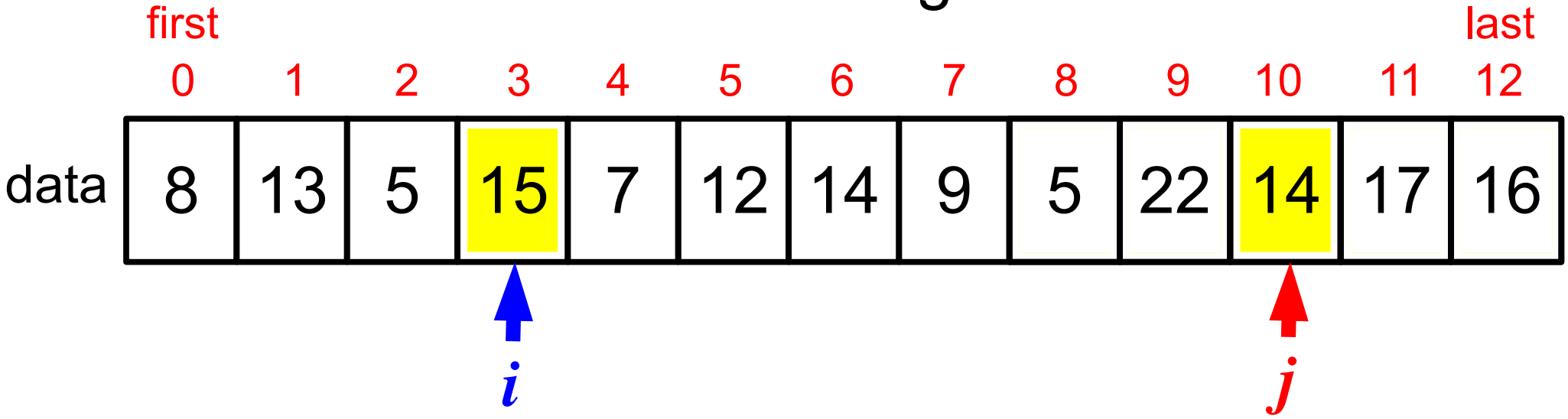

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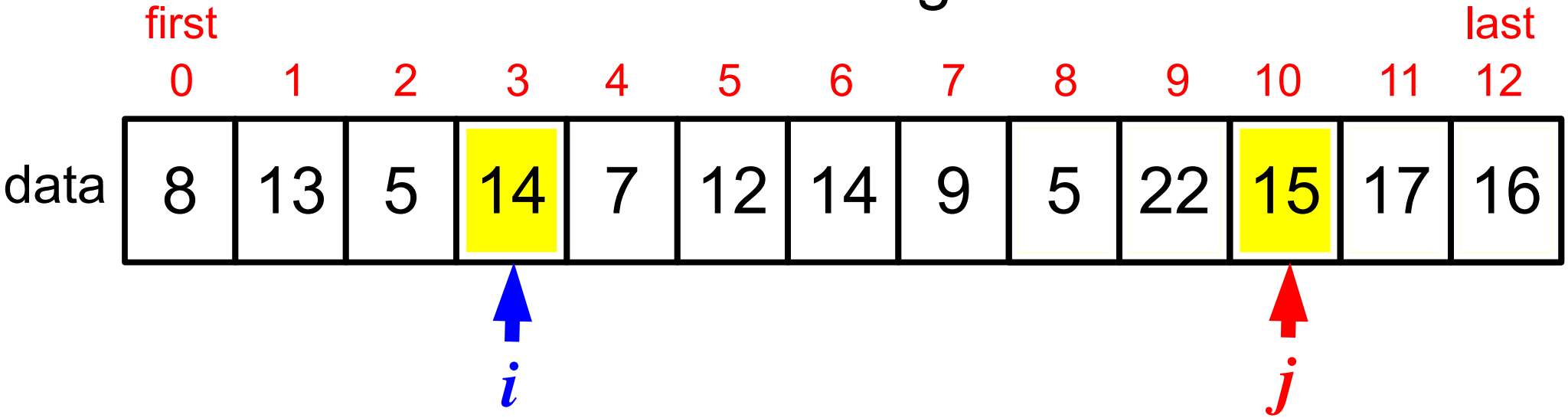

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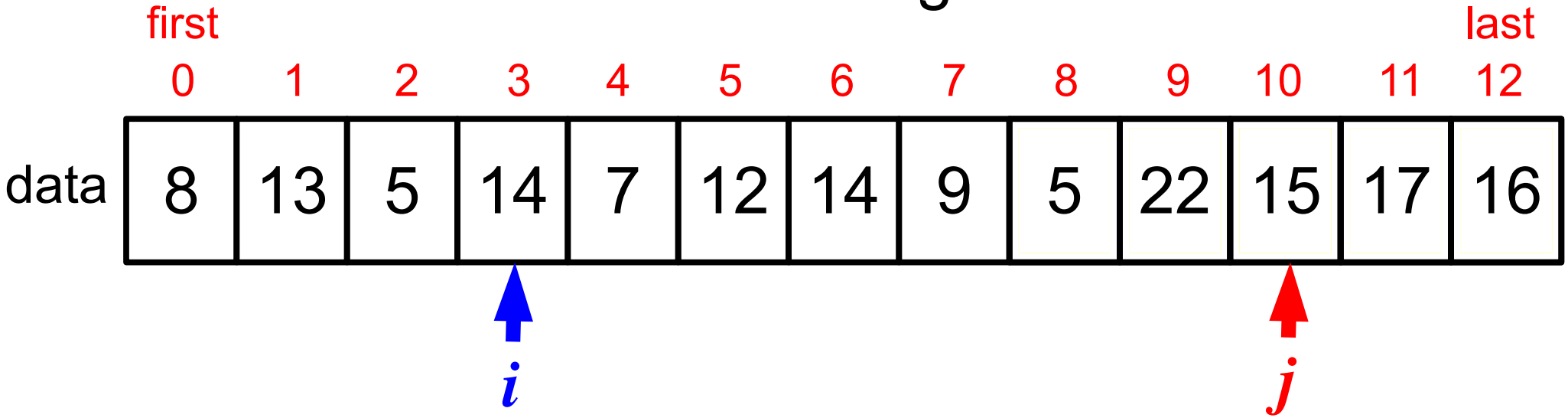

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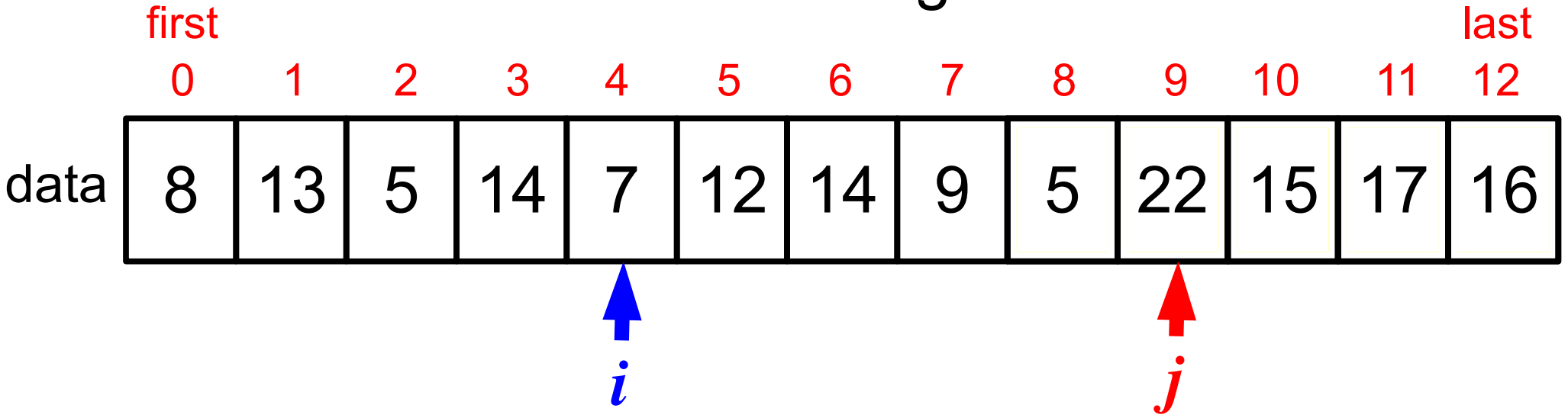

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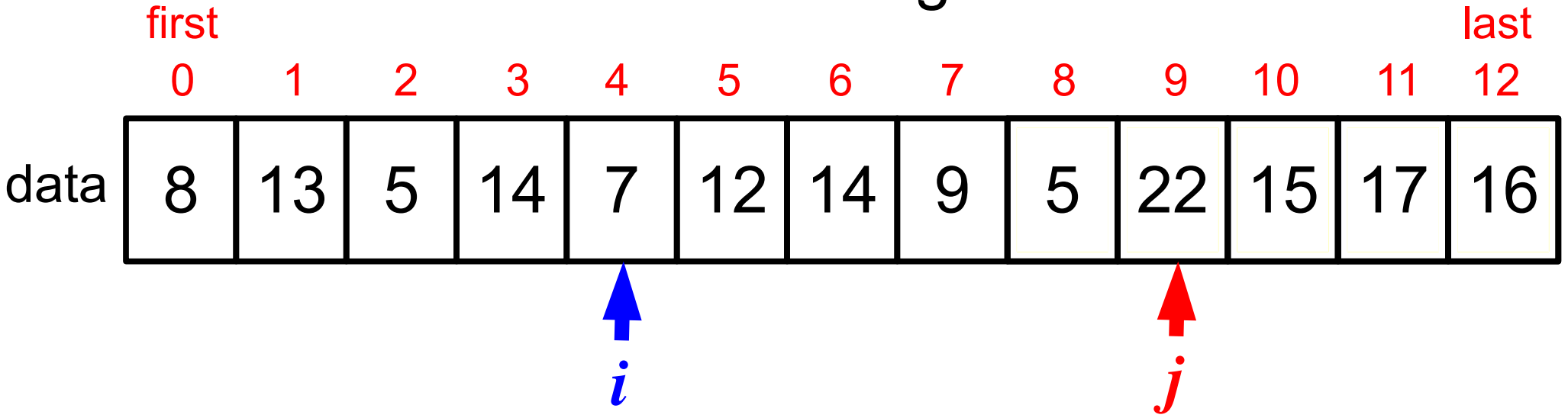

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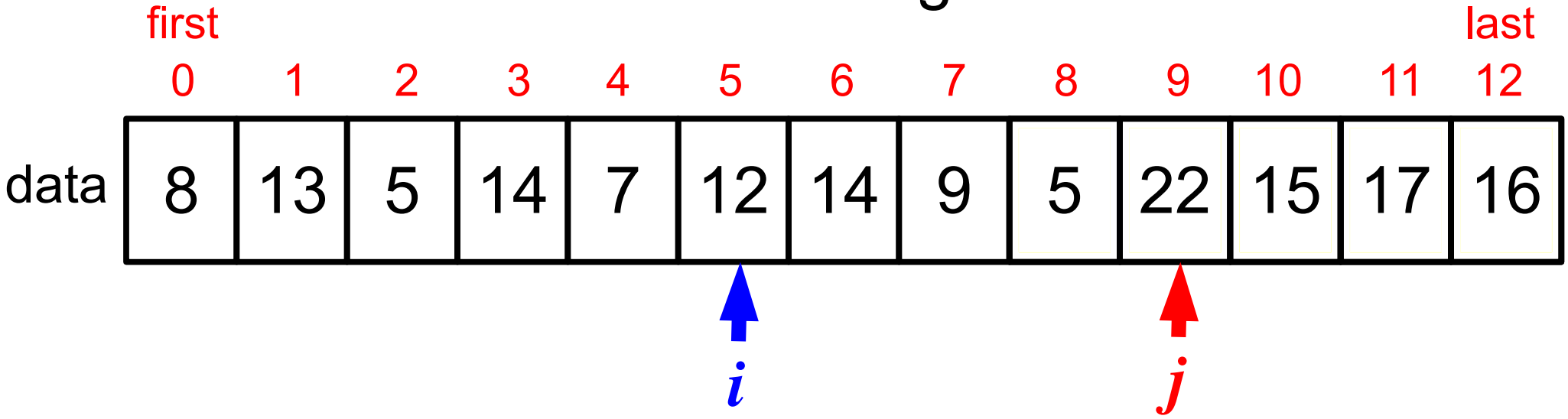

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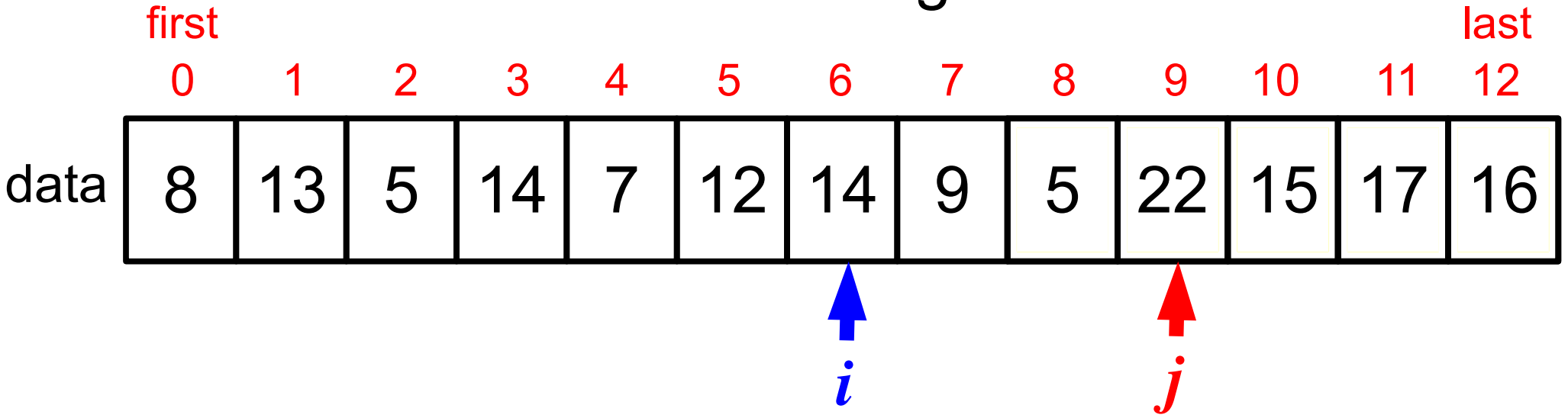

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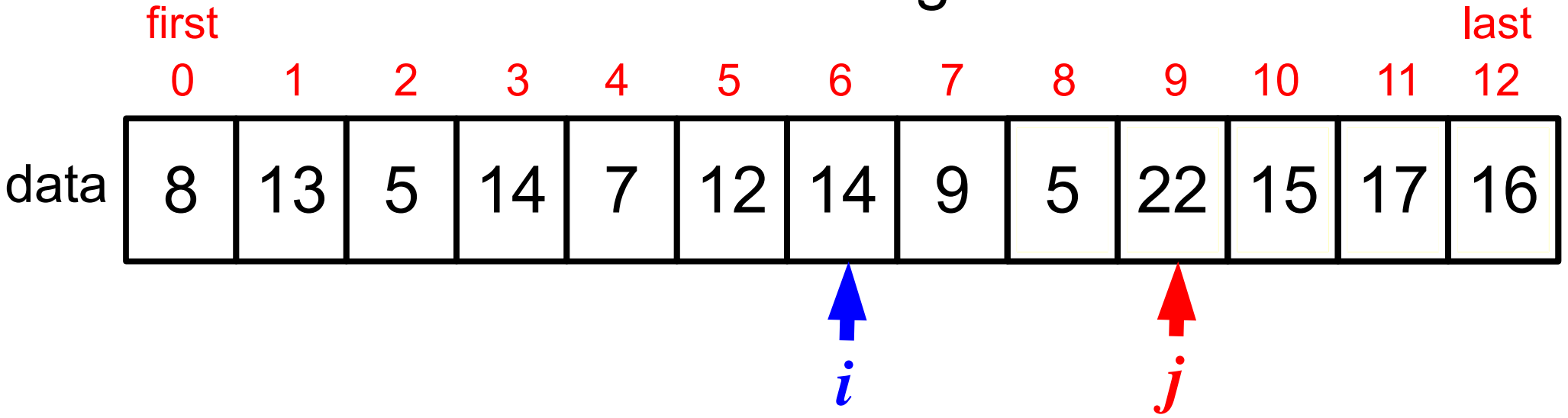

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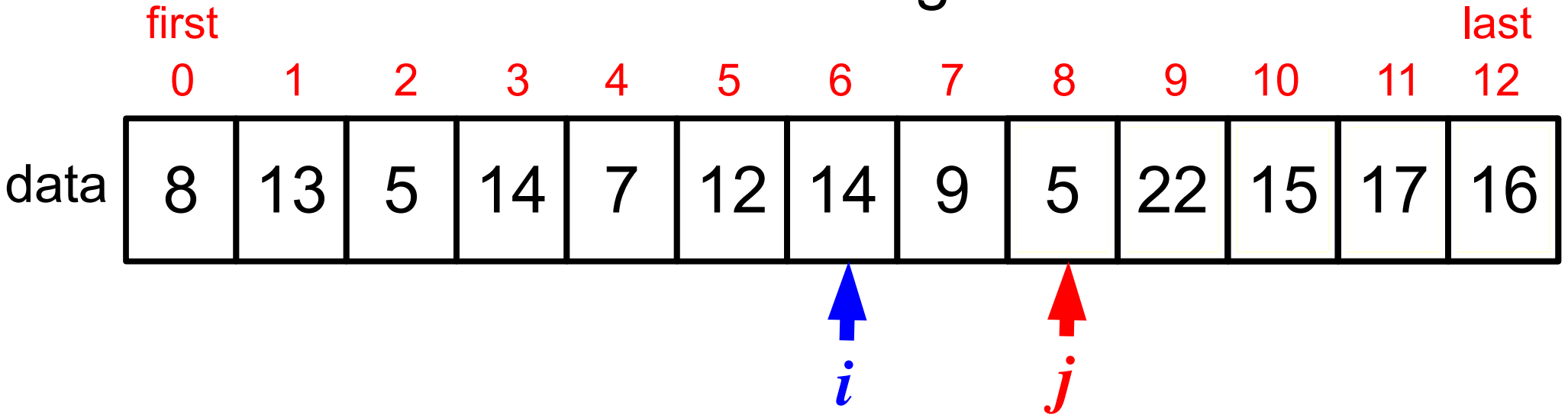

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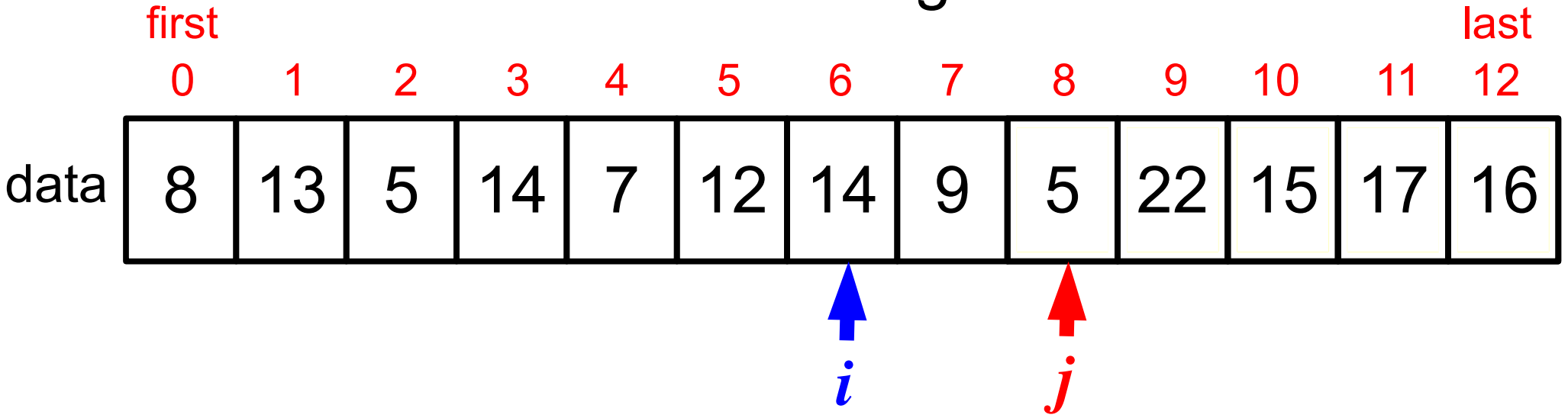

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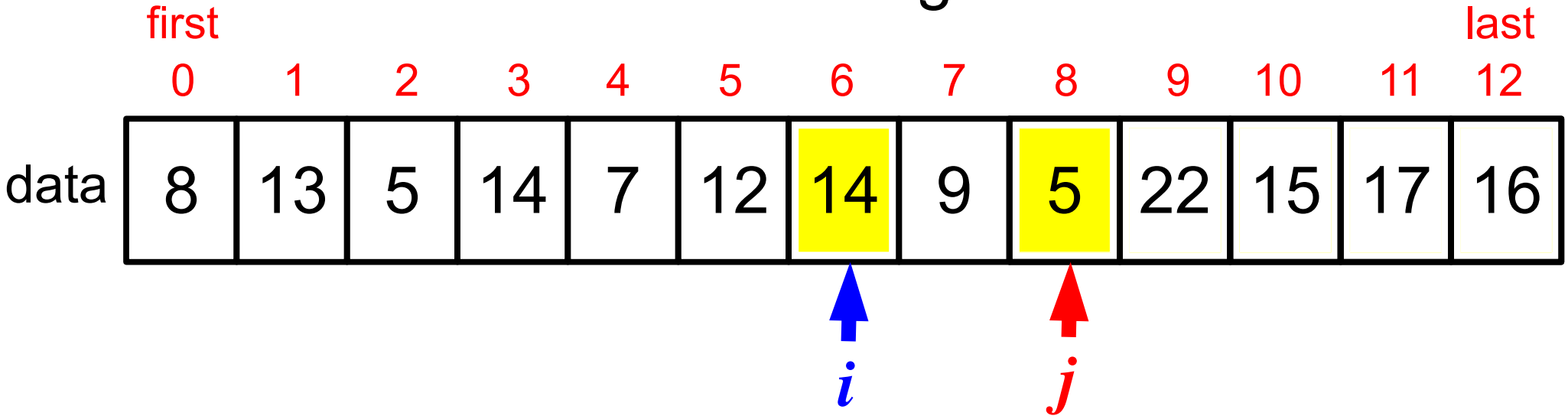

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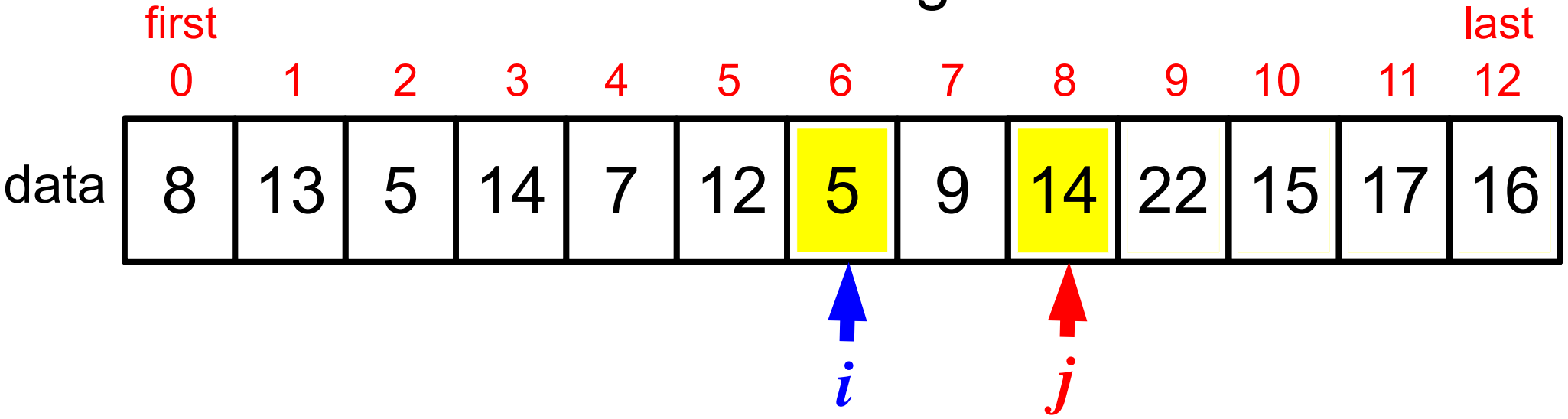

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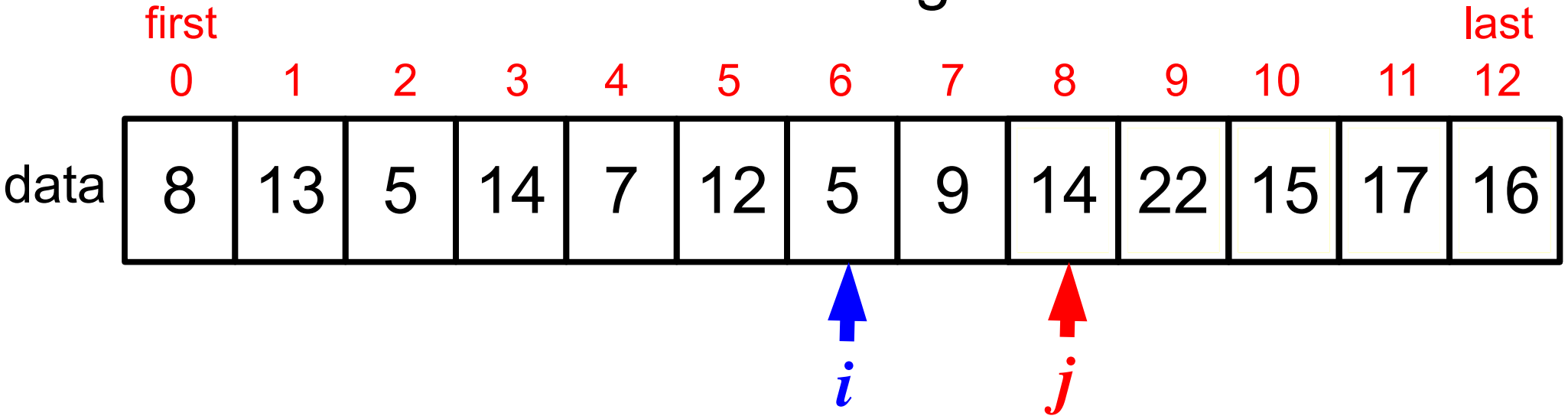

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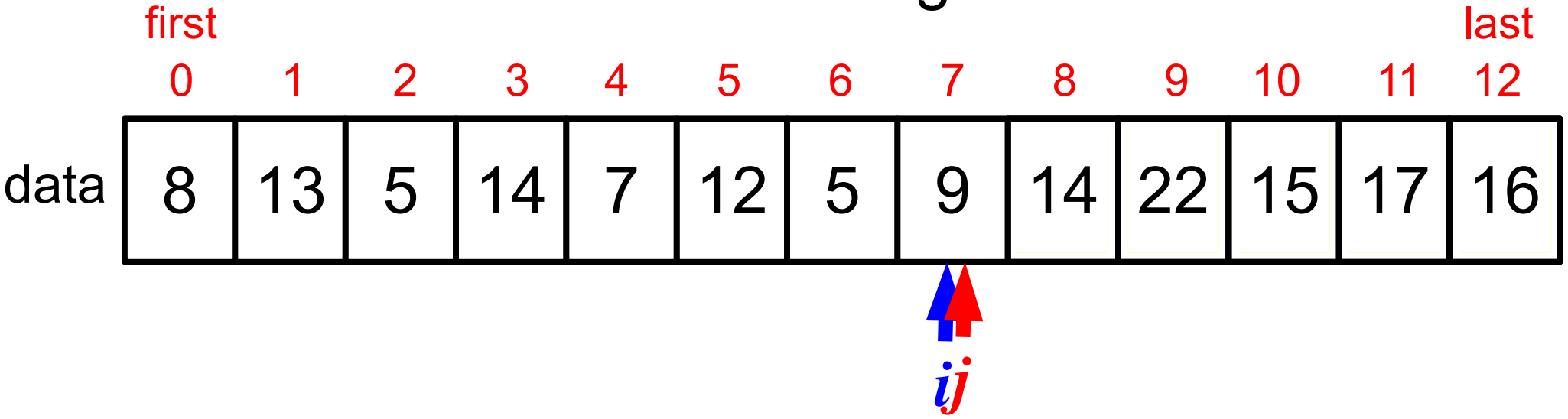

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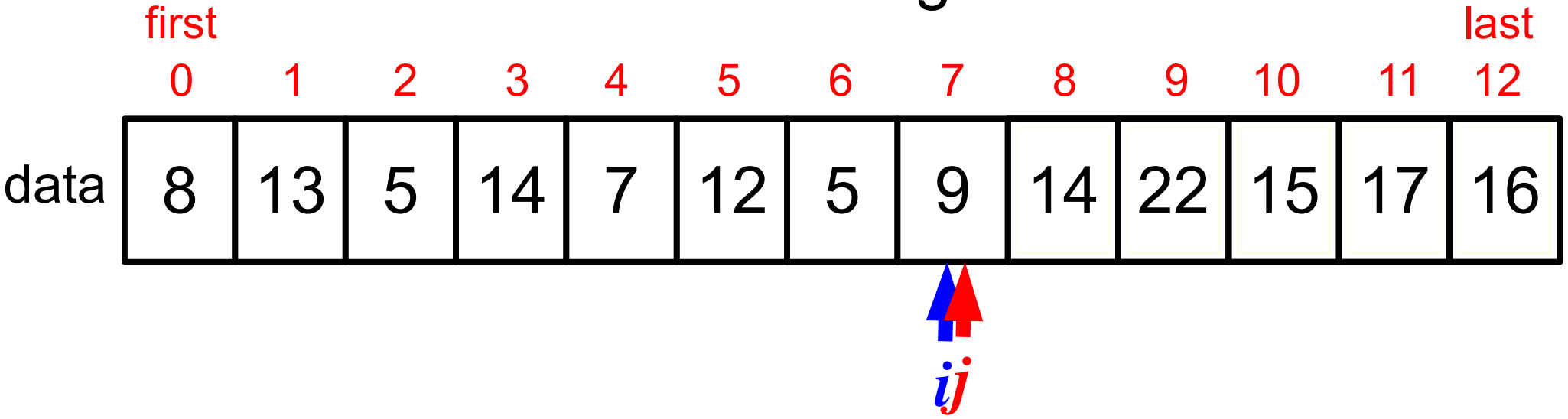

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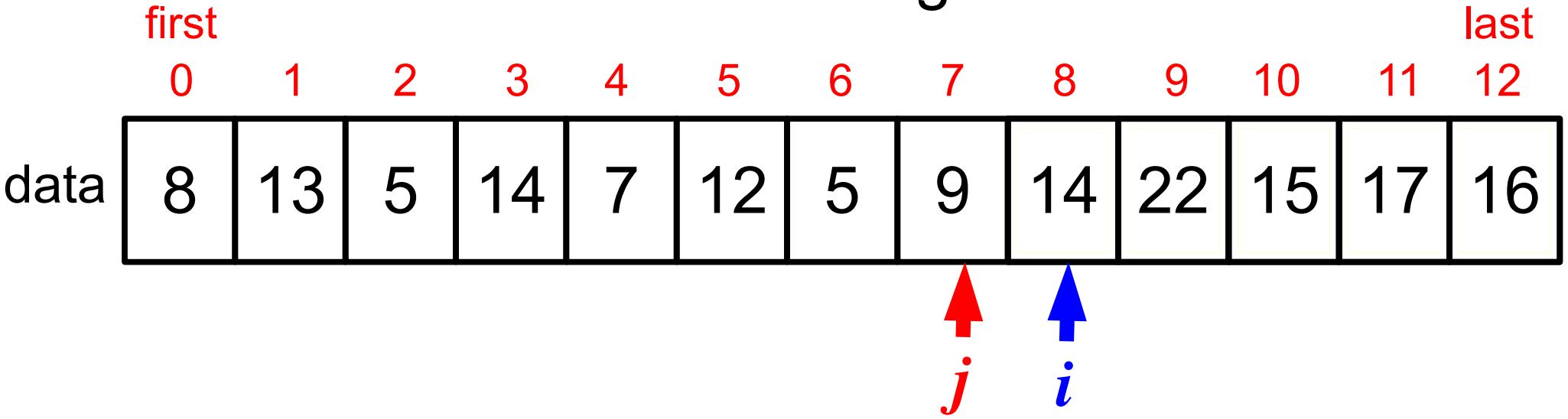

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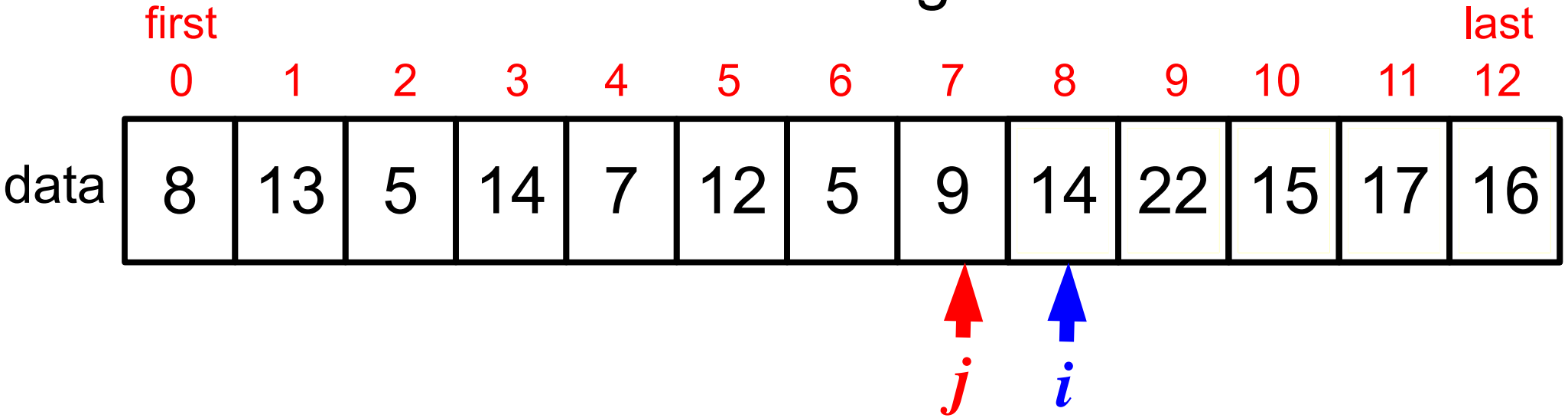

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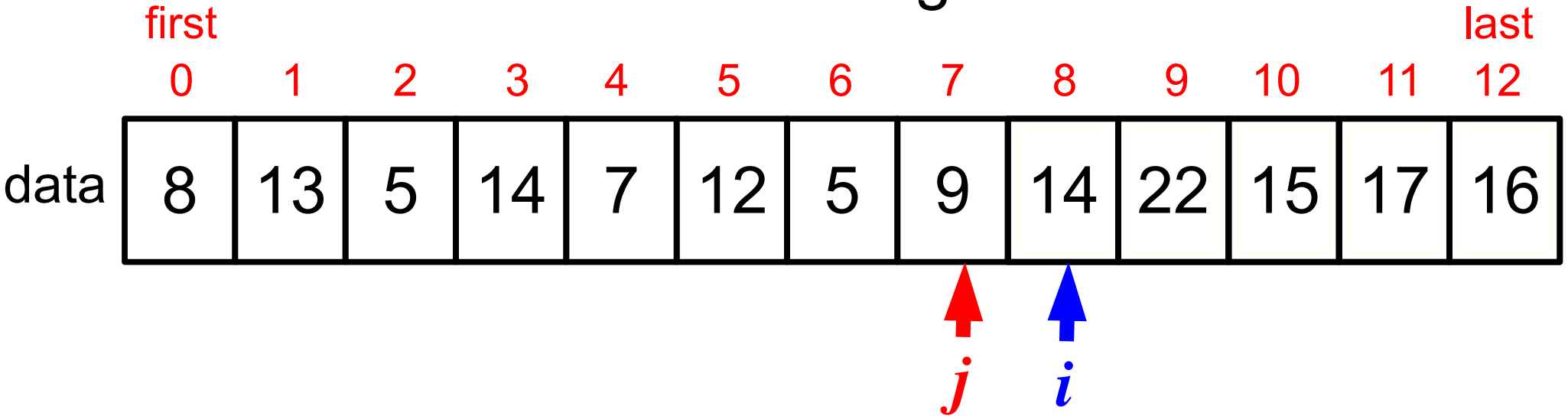

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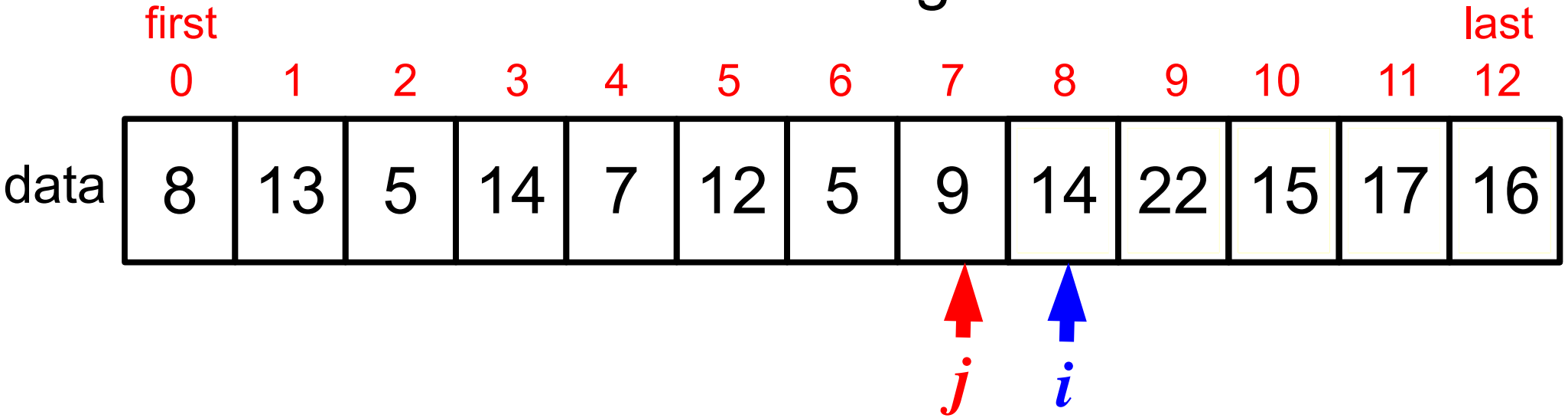

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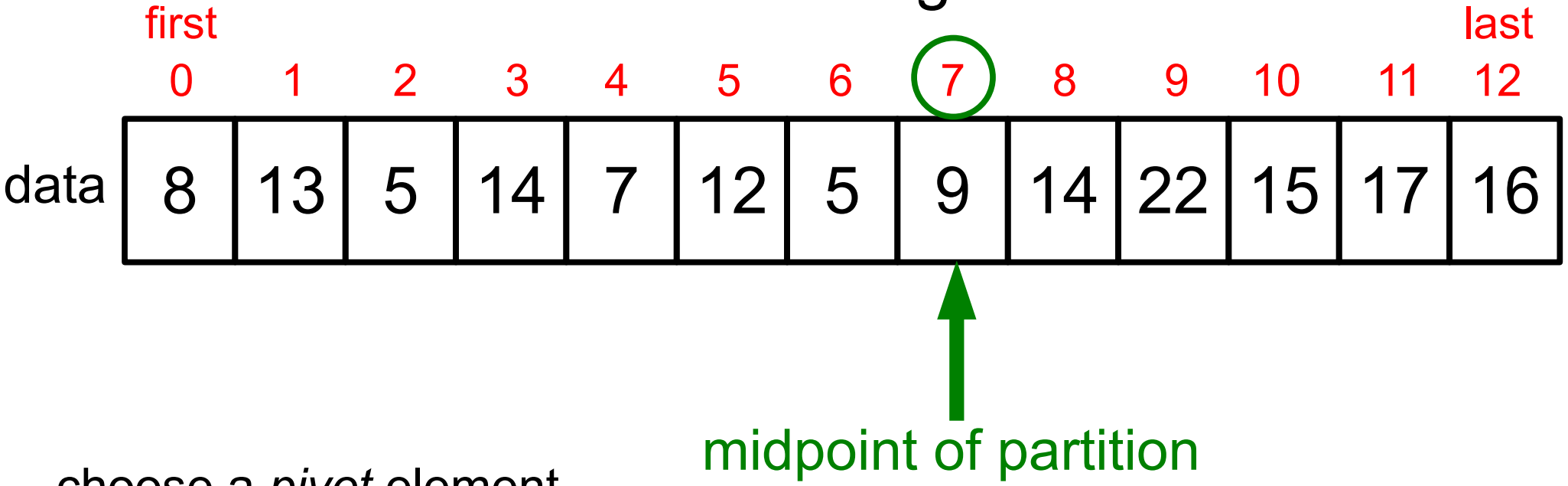

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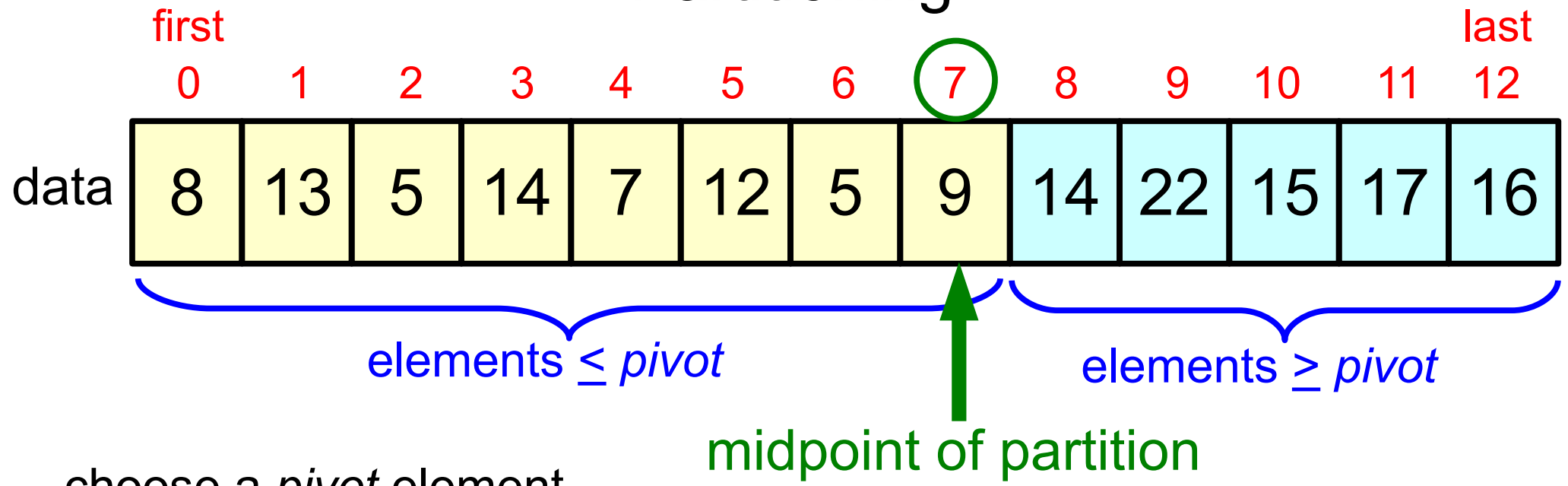
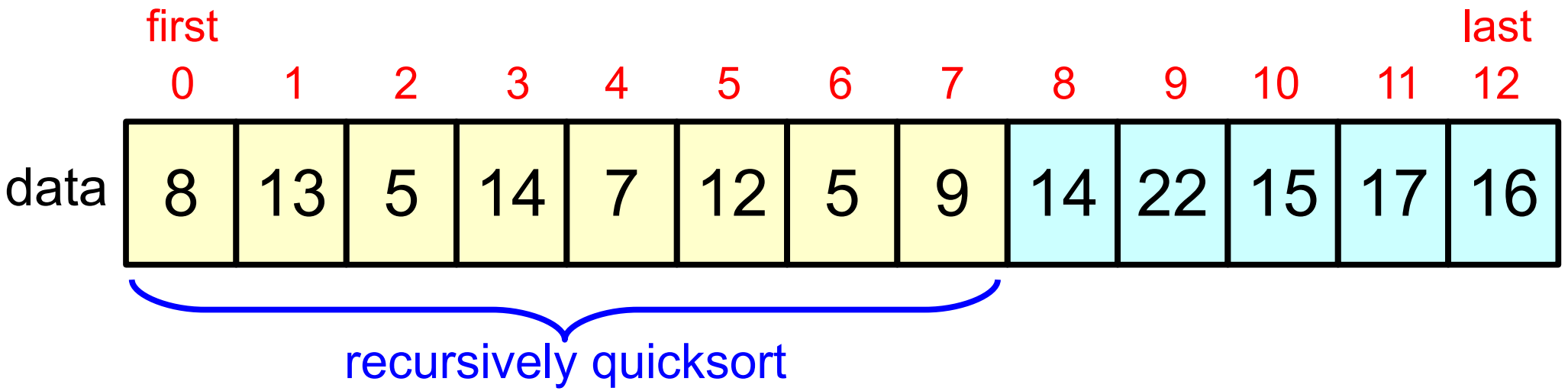
Partitioning



choose a *pivot* element
initialize left and right indices i and j
loop:
    move left index i rightward until we encounter an element ≥ *pivot*
    move right index j leftward until we encounter an element ≤ *pivot*
    if indices have met or crossed, quit the loop
    otherwise swap elements at positions i and j
    move i to right and j to left one position, and continue loop
return j as the midpoint position of the partition

pivot element = 14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17
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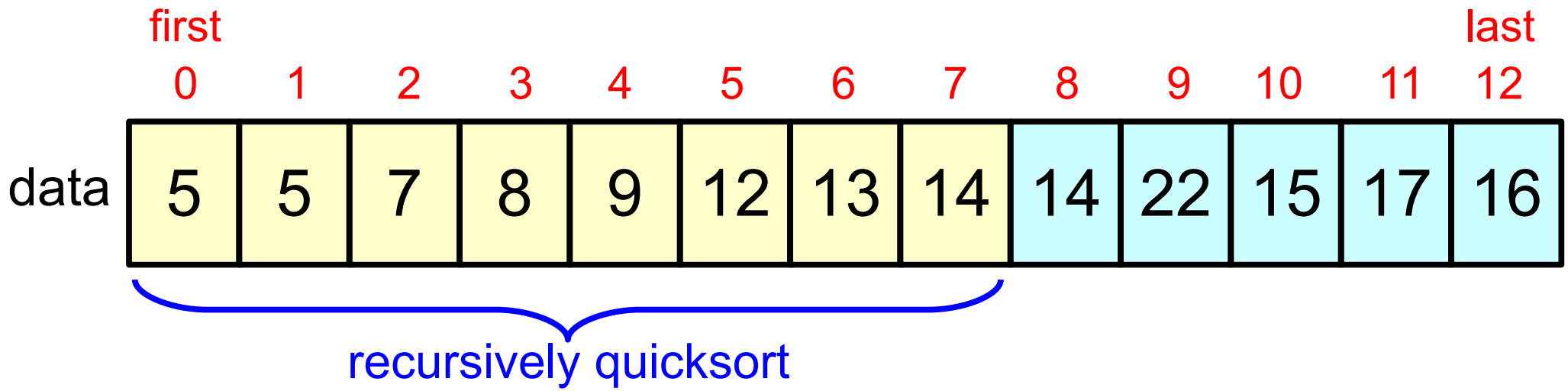
recursively quicksort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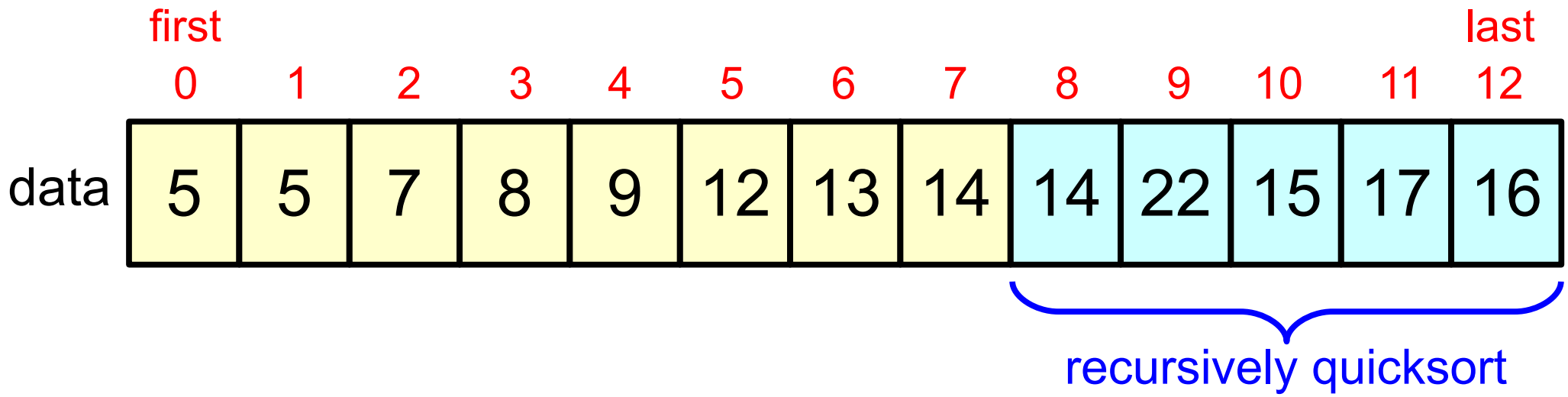
data
5 5 7 8 9 12 13 14 14 22 15 17 16
recursively quicksort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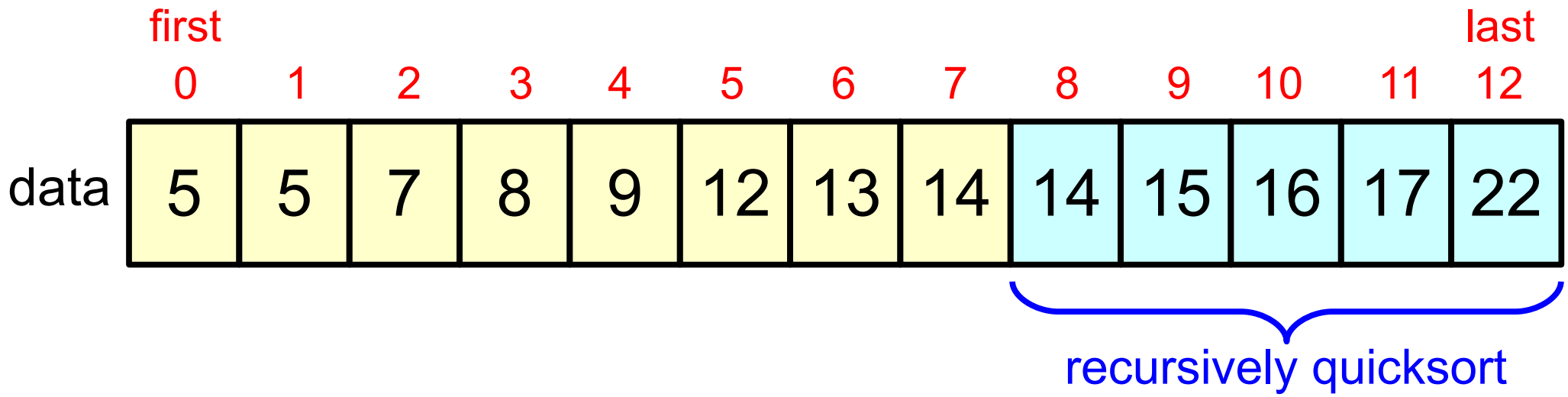
recursively quicksort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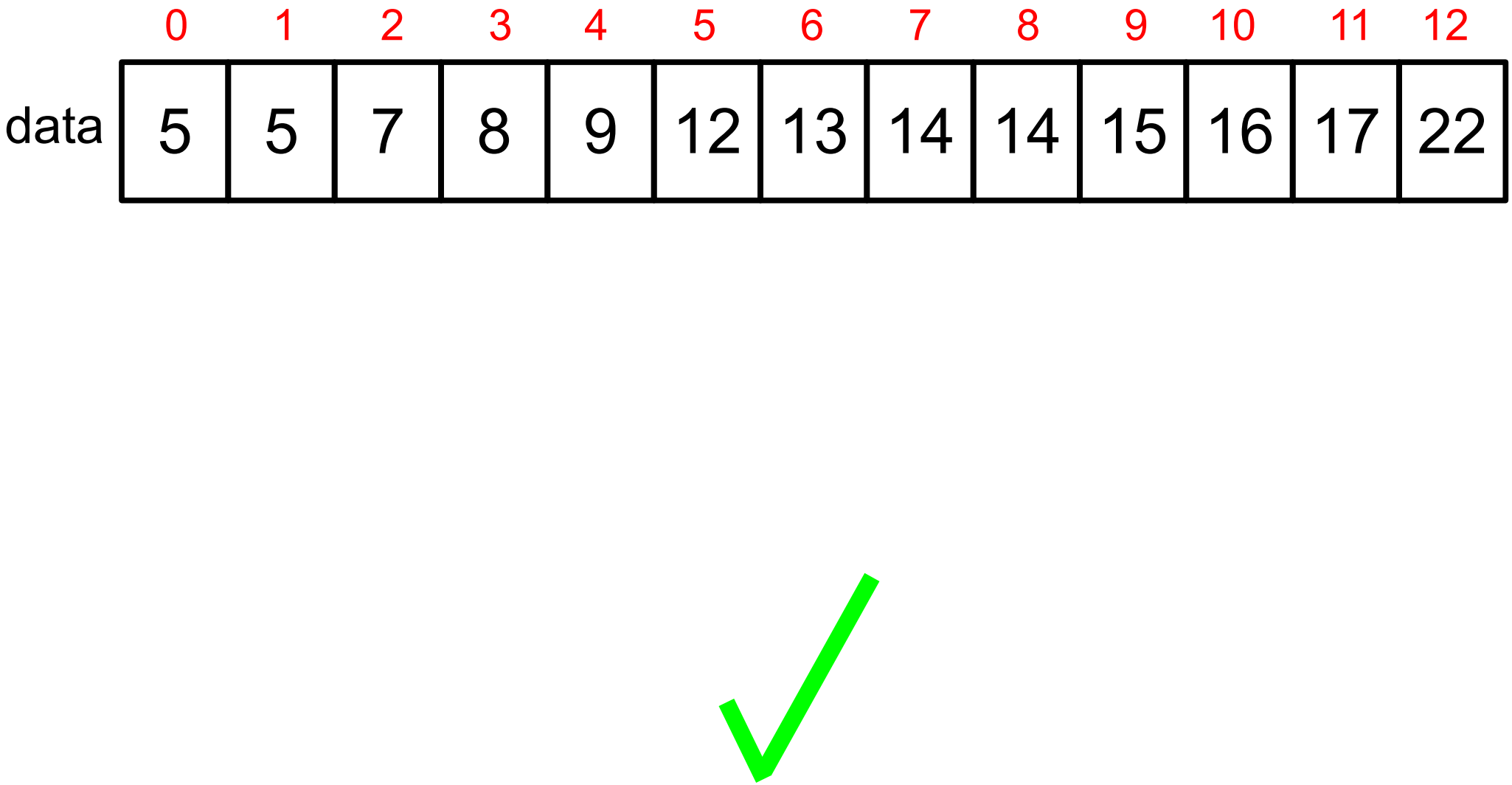
recursively quicksort


0 1 2 3 4 5 6 7 8 9 10 11 12
data
5 5 7 8 9 12 13 14 14 15 16 17 22