

Merge and Count

Merge and count step.

- Given two sorted halves, count number of inversions where a_i and a_j are in different halves.
- Combine two sorted halves into sorted whole.

$i = 6$



| | | | | | |
|---|---|----|----|----|----|
| 3 | 7 | 10 | 14 | 18 | 19 |
|---|---|----|----|----|----|



| | | | | | |
|---|----|----|----|----|----|
| 2 | 11 | 16 | 17 | 23 | 25 |
|---|----|----|----|----|----|

two sorted halves

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

auxiliary array

Total:

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|---|----|----|----|----|----|

two sorted halves

6

| | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|
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two sorted halves

6

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|---|--|--|--|--|--|--|--|--|--|--|--|
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auxiliary array

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two sorted halves

6



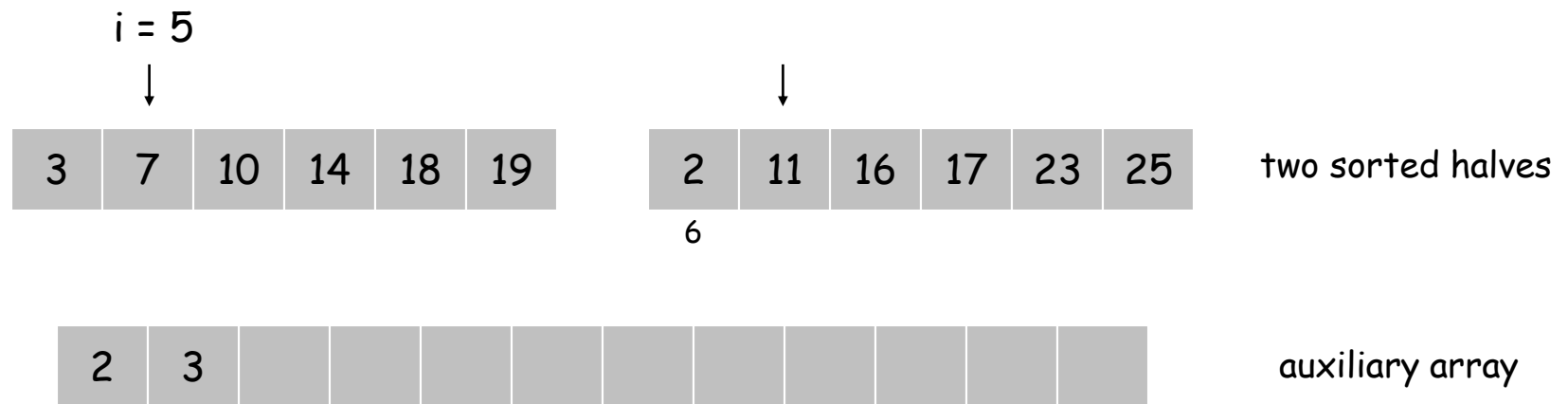
auxiliary array

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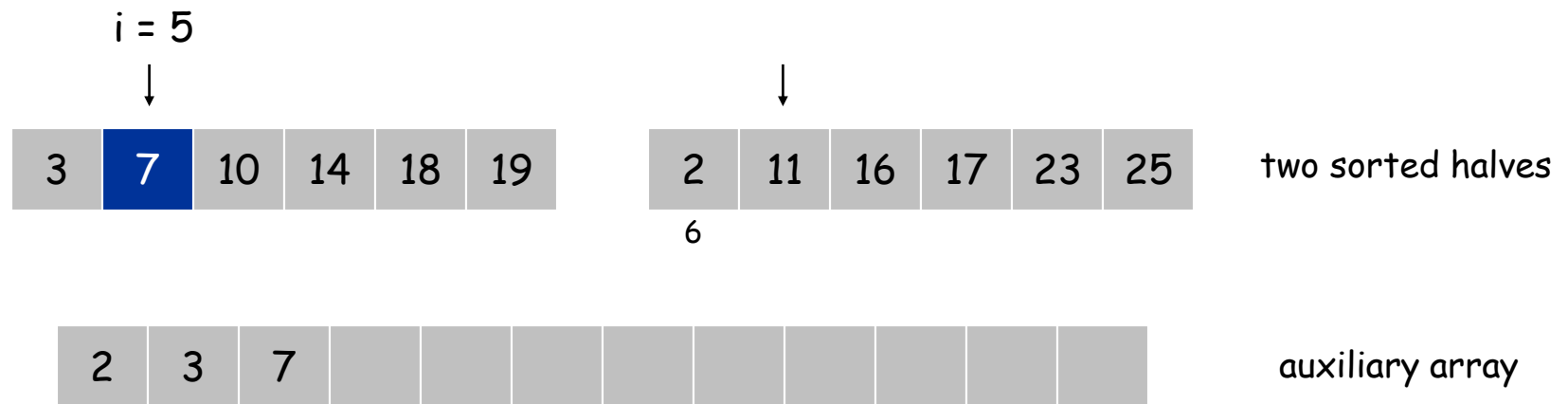


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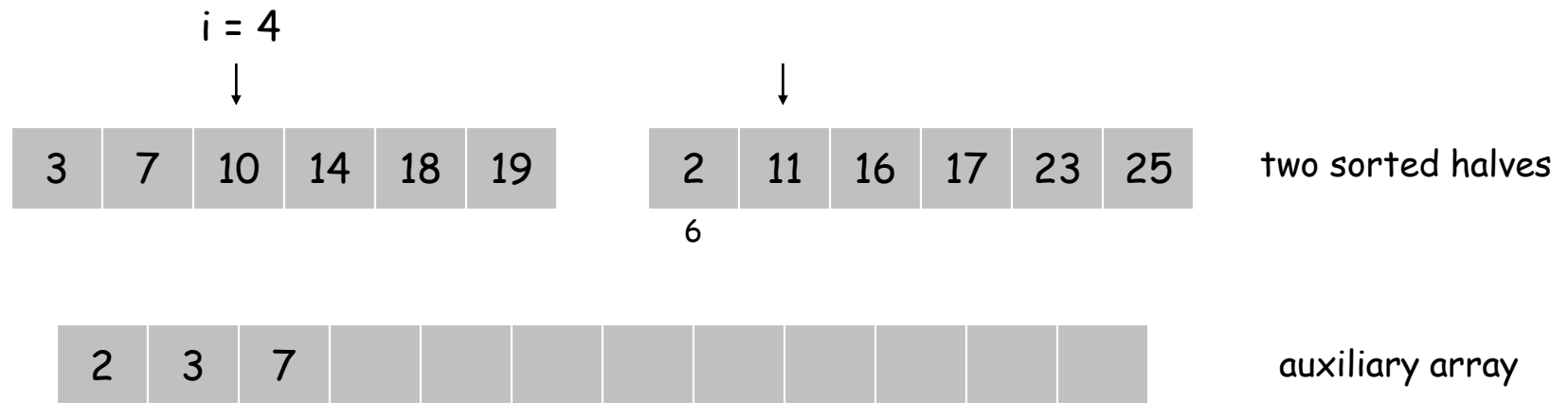


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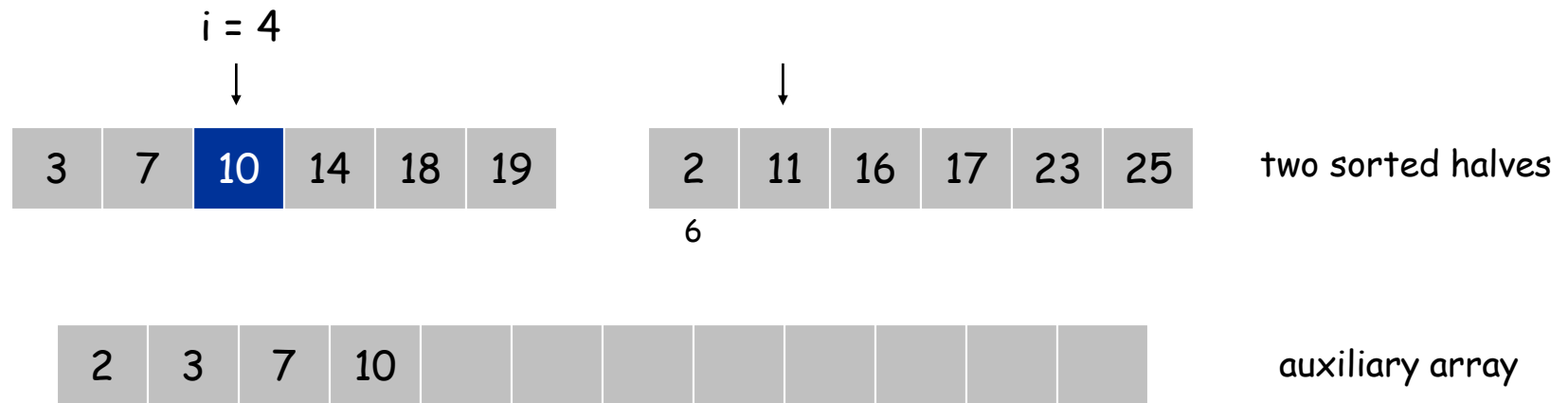


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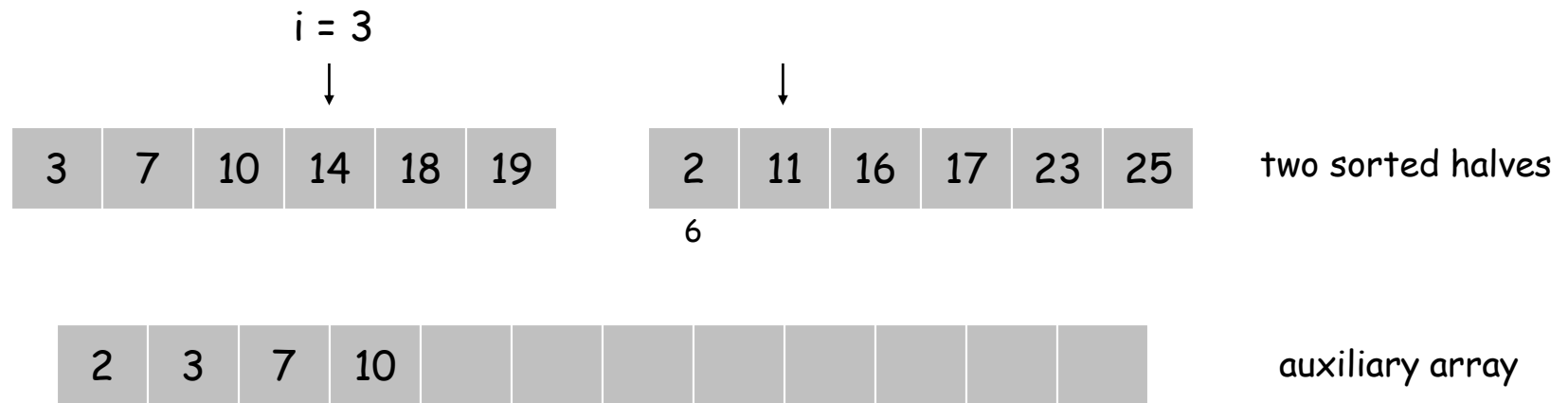


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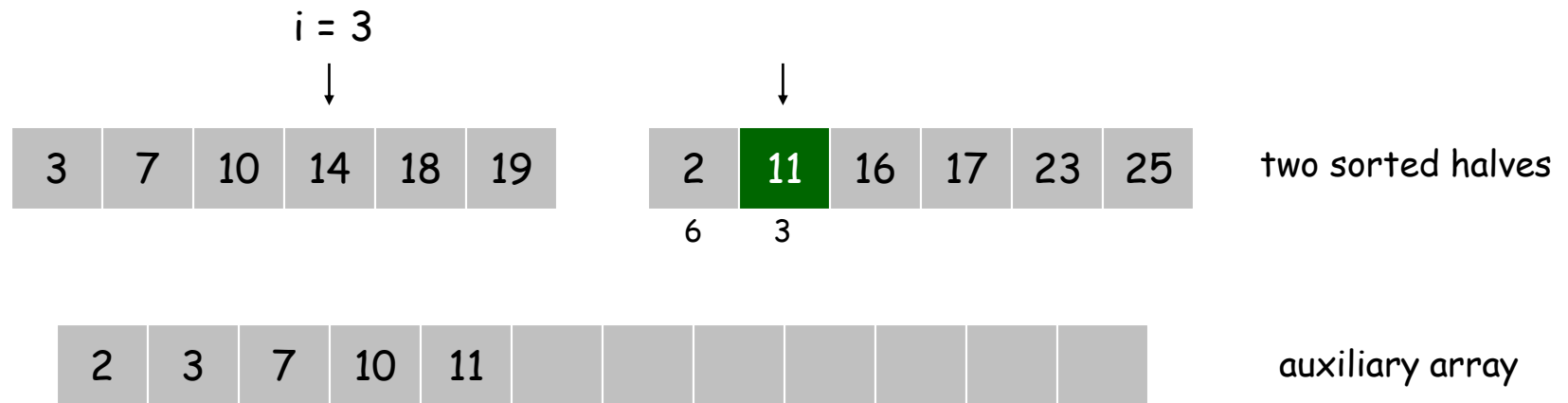


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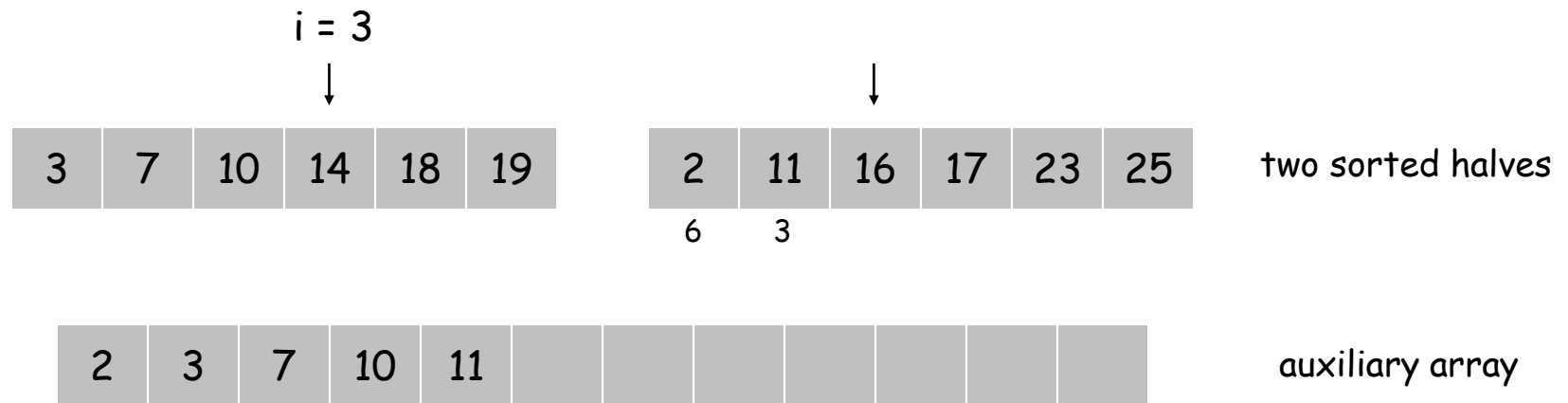


Total: 6 + 3

Merge and Count

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- Given two sorted halves, count number of inversions where a_i and a_j are in different halves.
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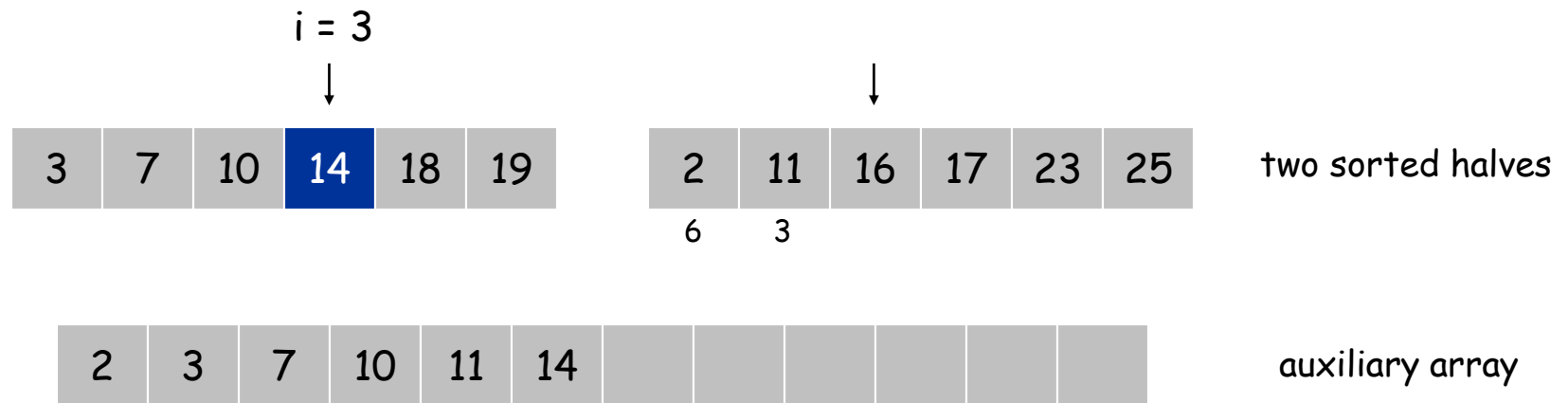


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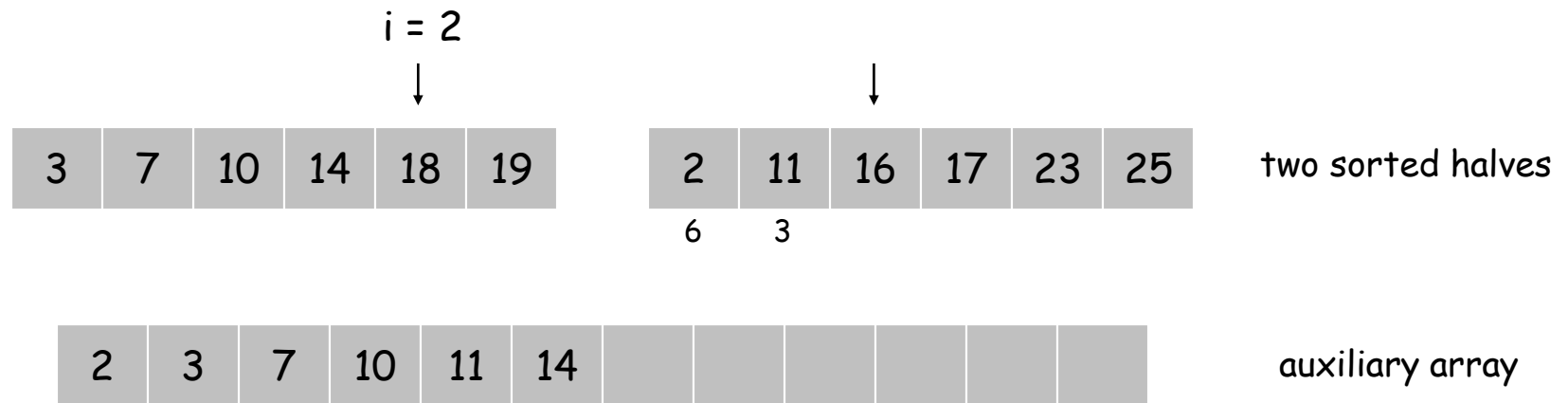


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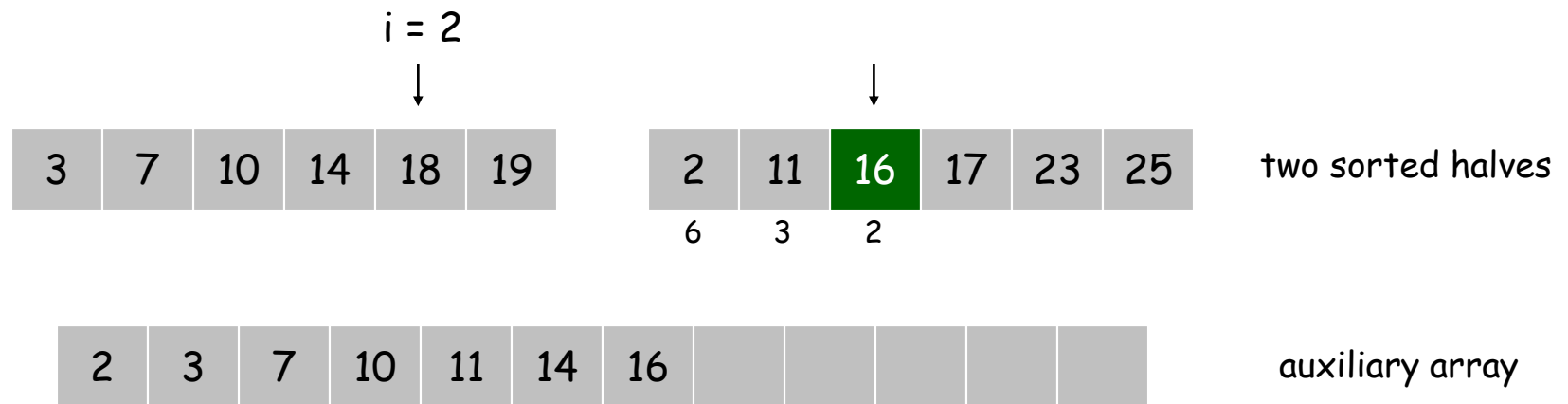


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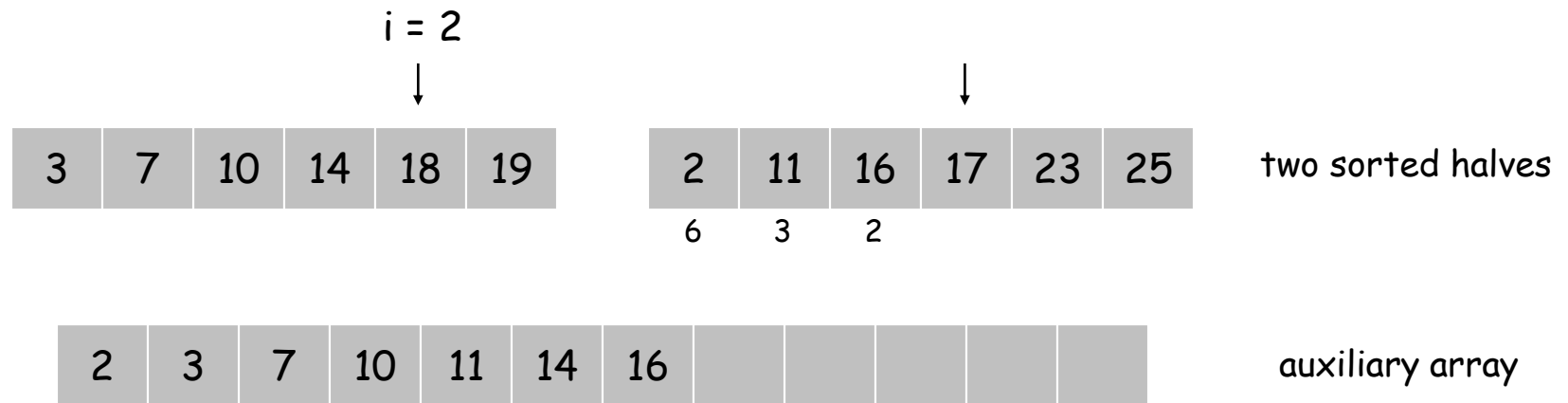


Total: $6 + 3 + 2$

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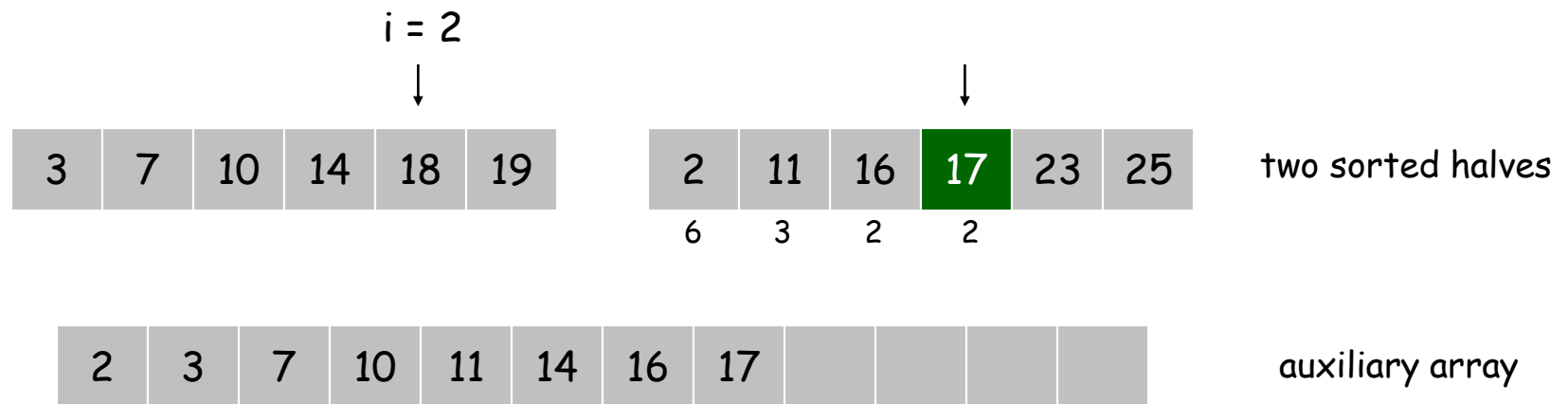


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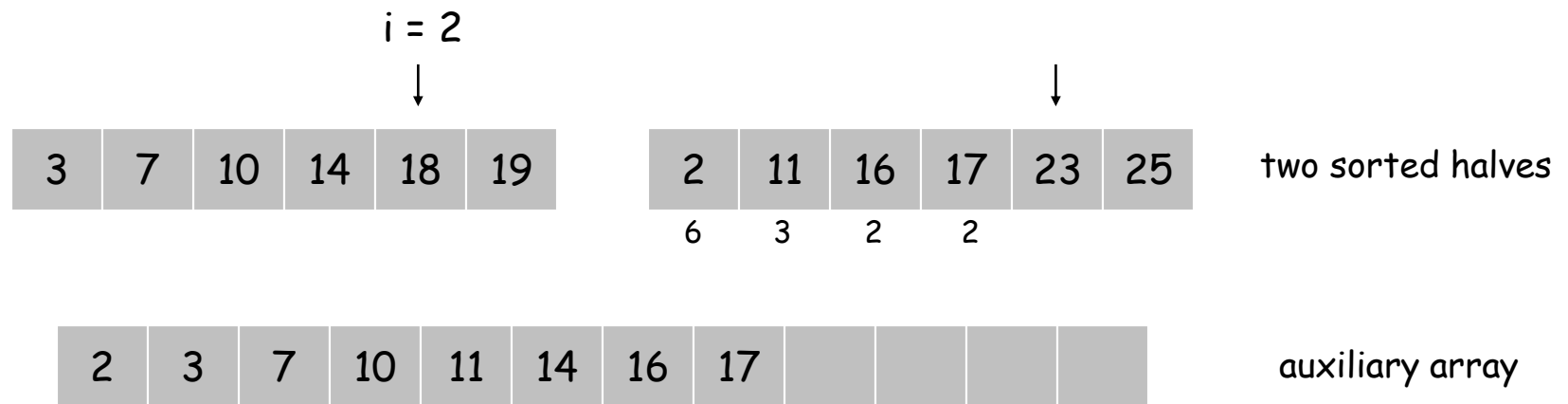


Total: $6 + 3 + 2 + 2$

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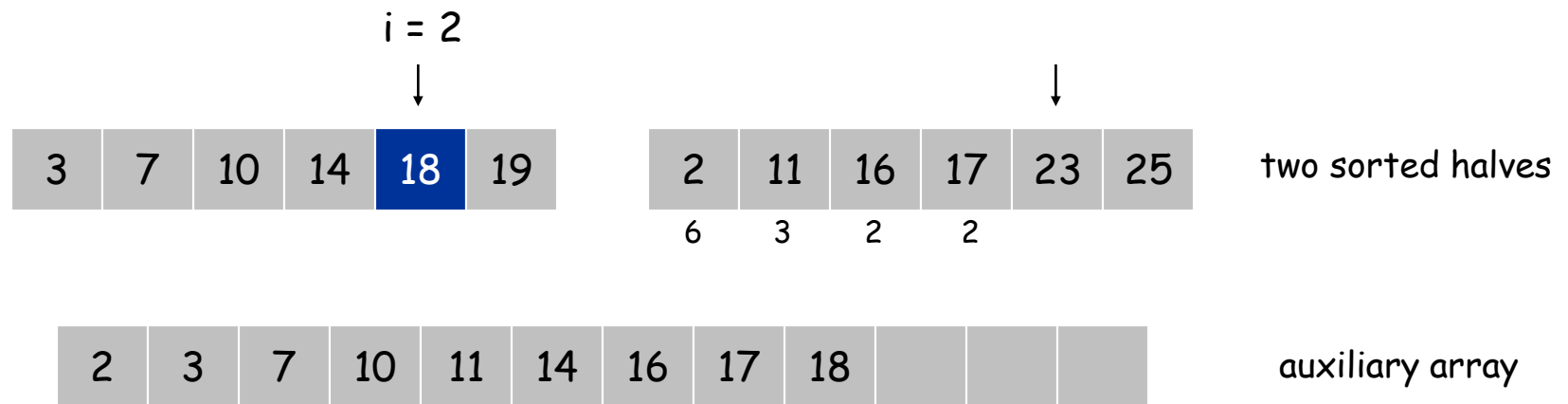


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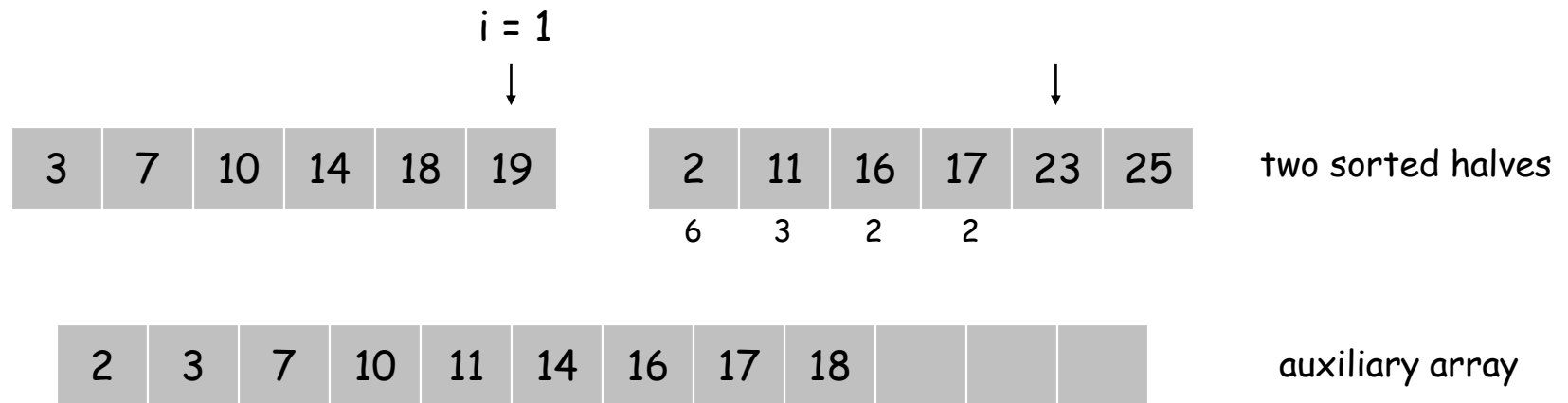


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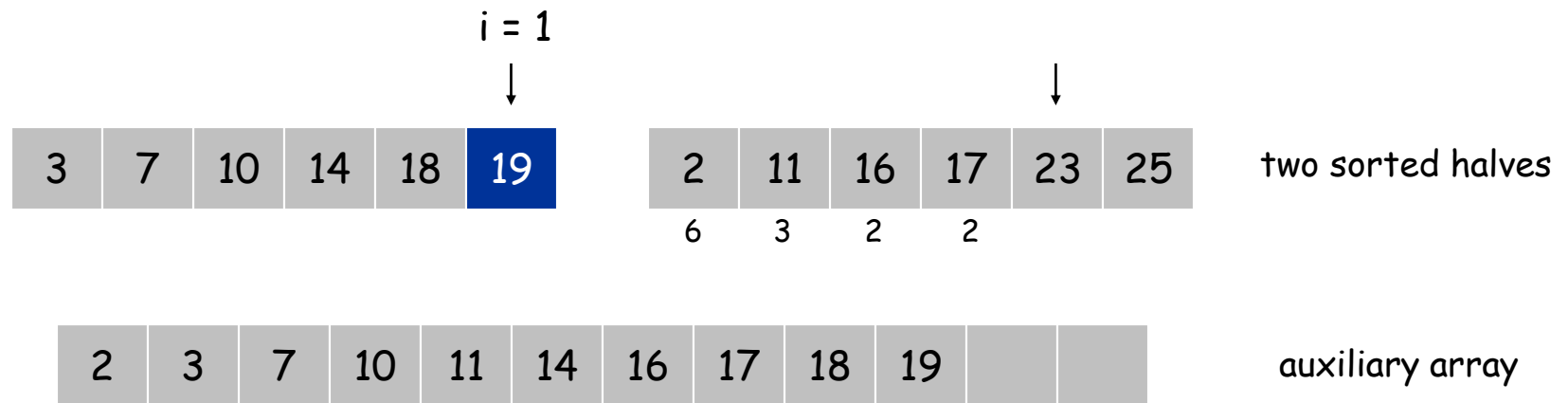


Total: $6 + 3 + 2 + 2$

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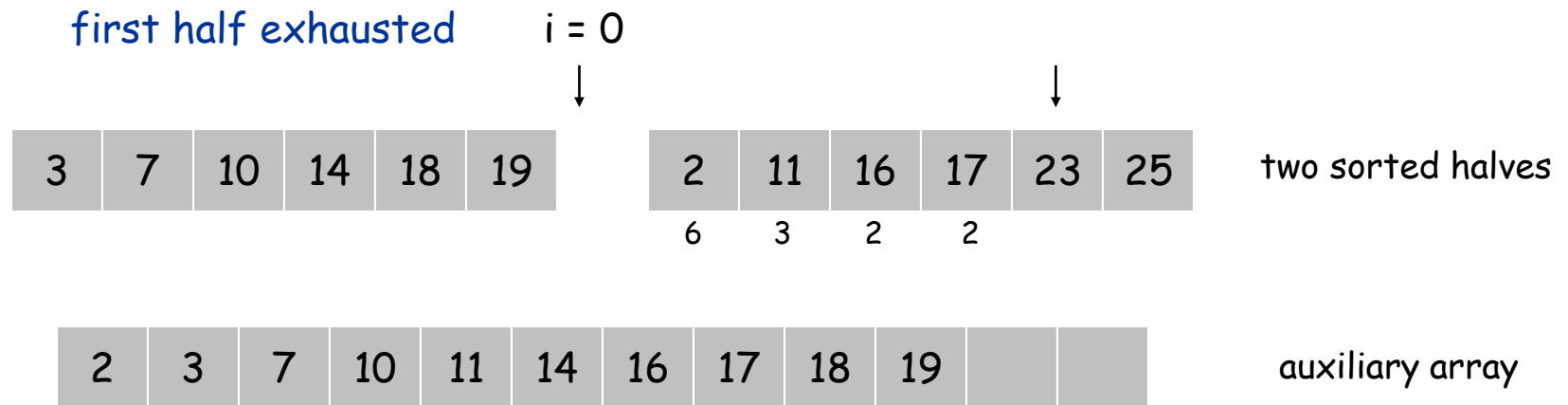


Total: $6 + 3 + 2 + 2$

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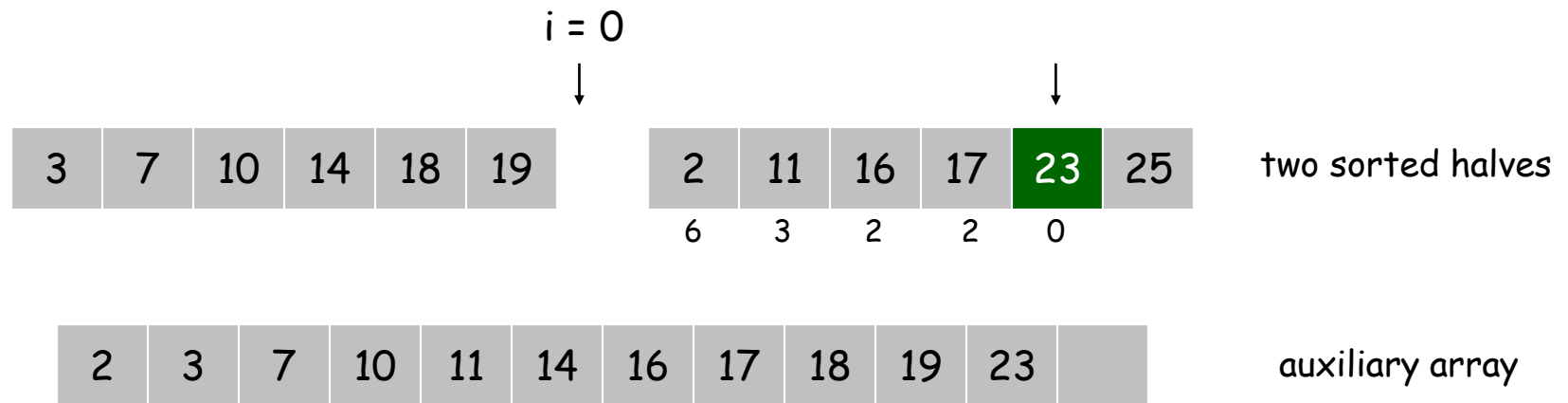


Total: $6 + 3 + 2 + 2$

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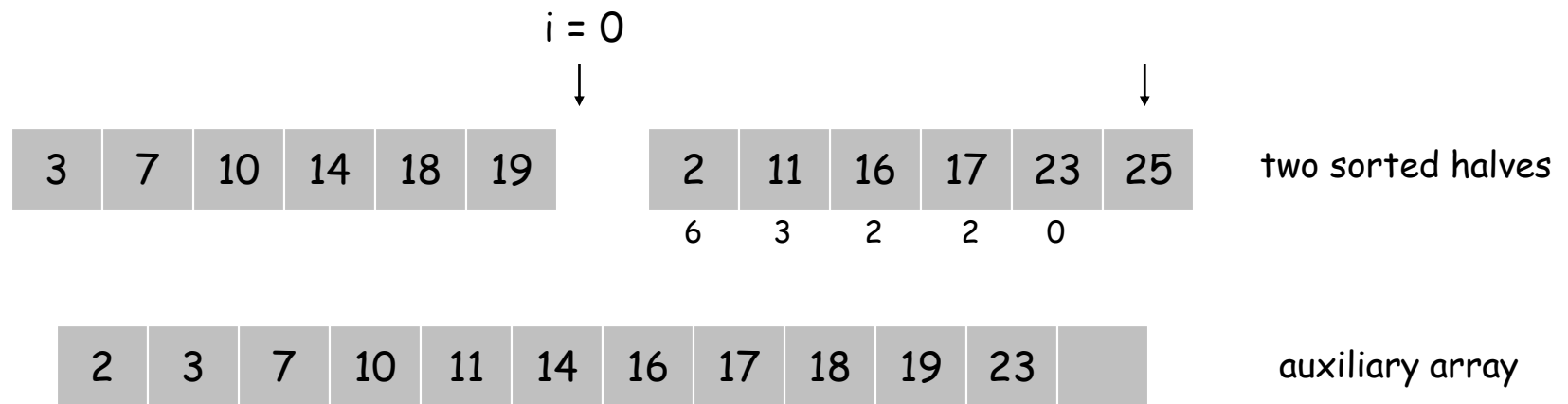


Total: $6 + 3 + 2 + 2 + 0$

Merge and Count

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- Given two sorted halves, count number of inversions where a_i and a_j are in different halves.
- Combine two sorted halves into sorted whole.

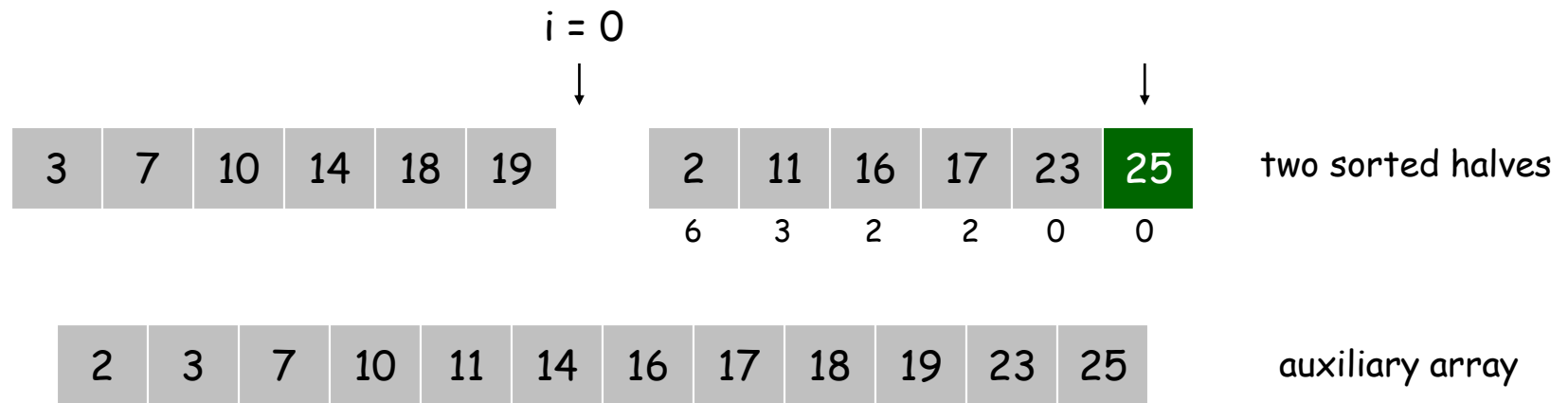


Total: $6 + 3 + 2 + 2 + 0$

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- Given two sorted halves, count number of inversions where a_i and a_j are in different halves.
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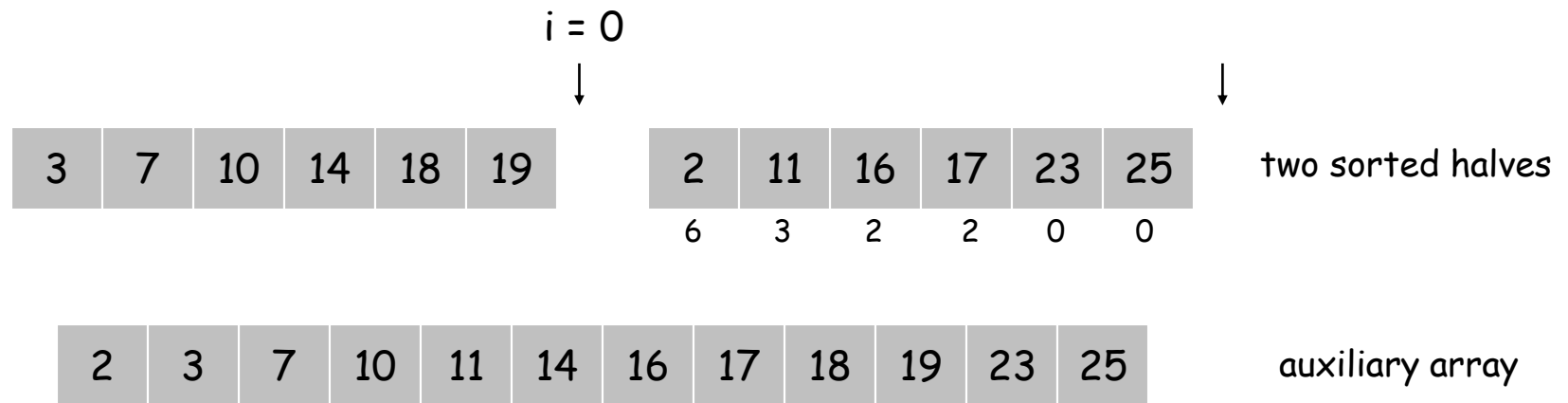


Total: $6 + 3 + 2 + 2 + 0 + 0$

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- Given two sorted halves, count number of inversions where a_i and a_j are in different halves.
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Total: $6 + 3 + 2 + 2 + 0 + 0 = 13$