make history.

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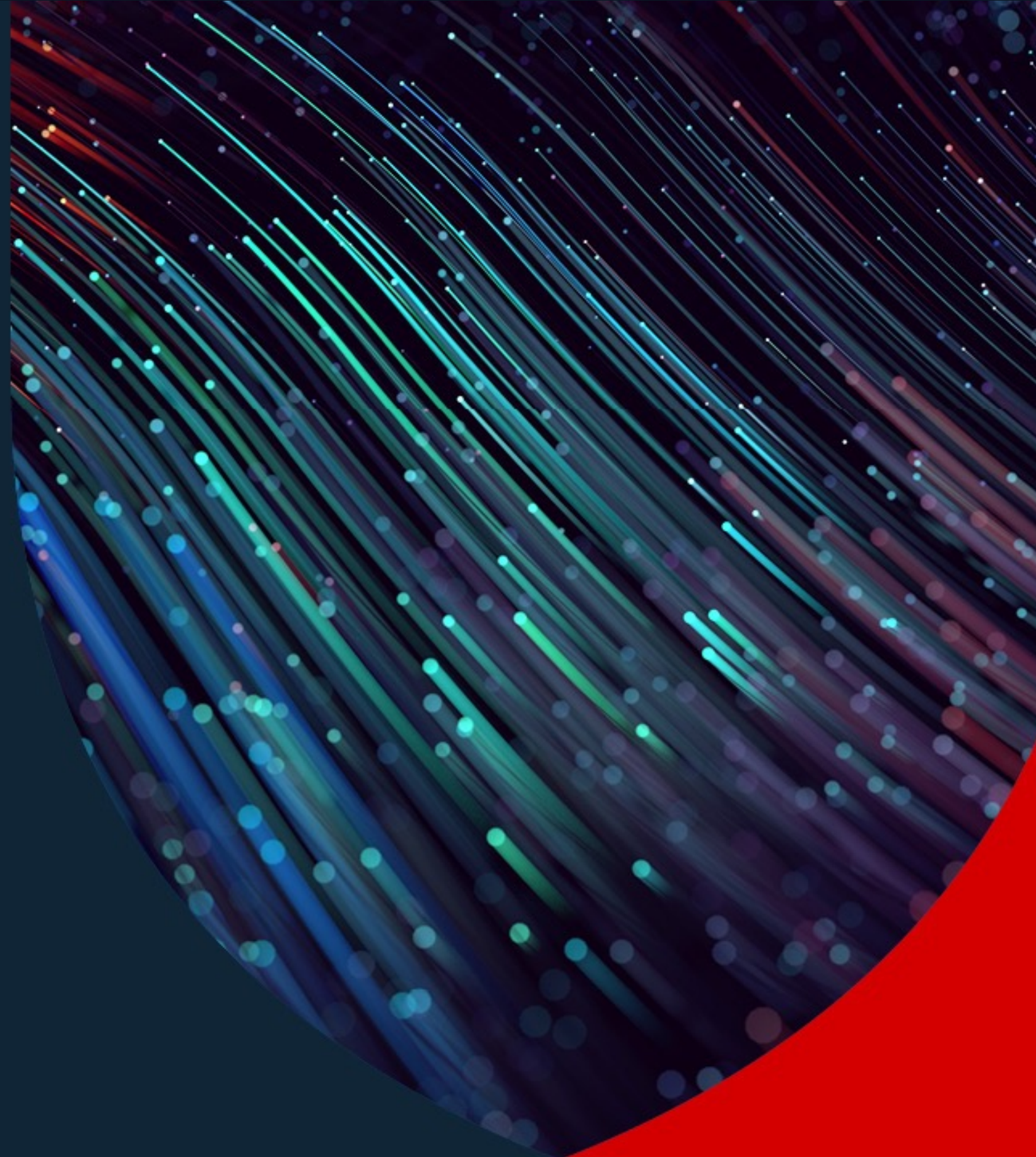


Quick sort

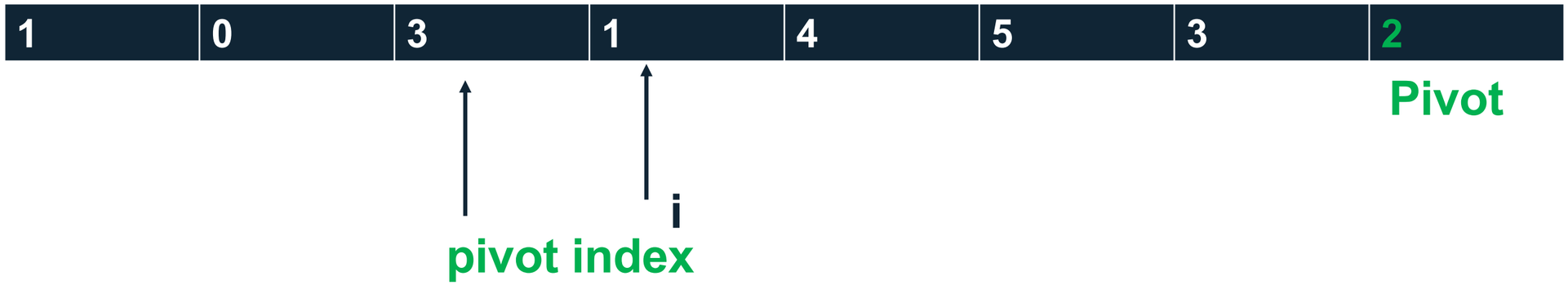
Dr. Anna Kalenkova

Quick sort

Quick sort

Quick sort

Quick sort



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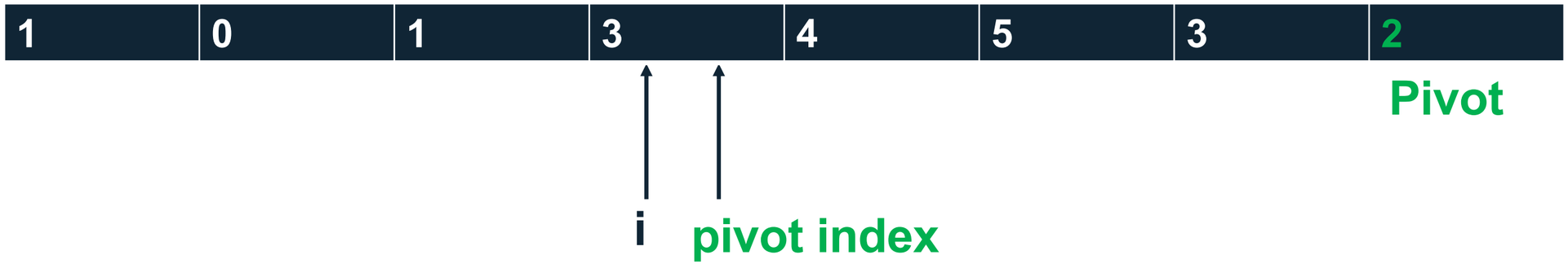

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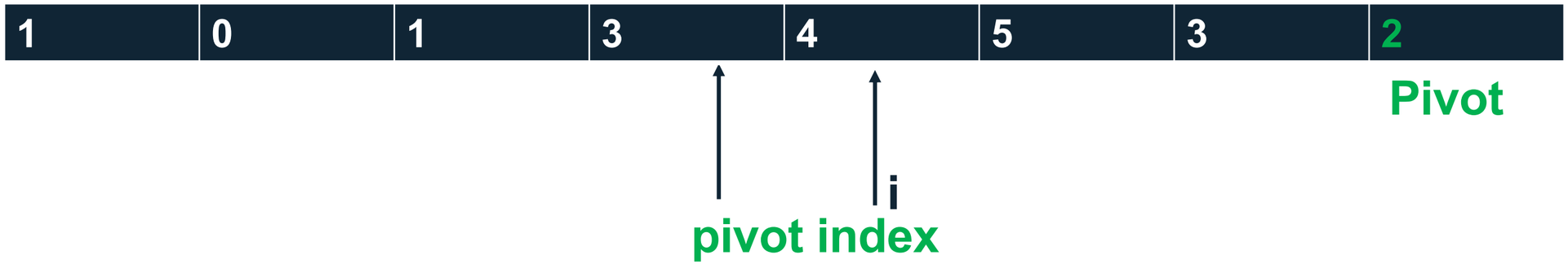

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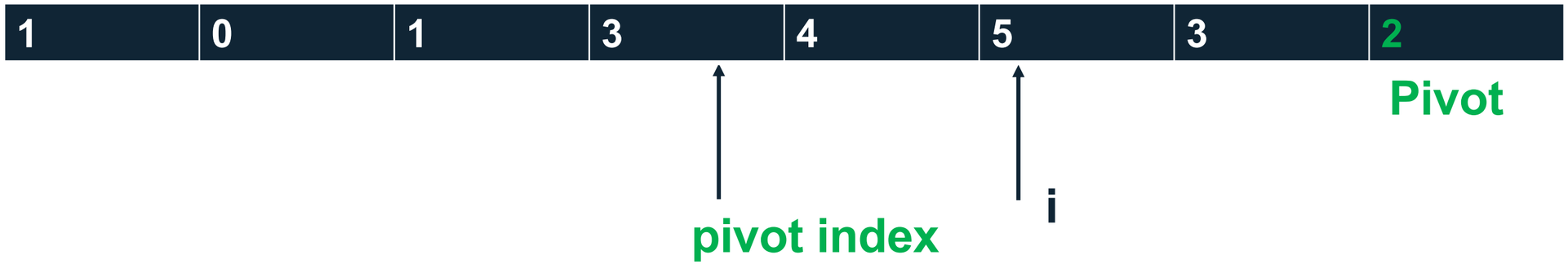

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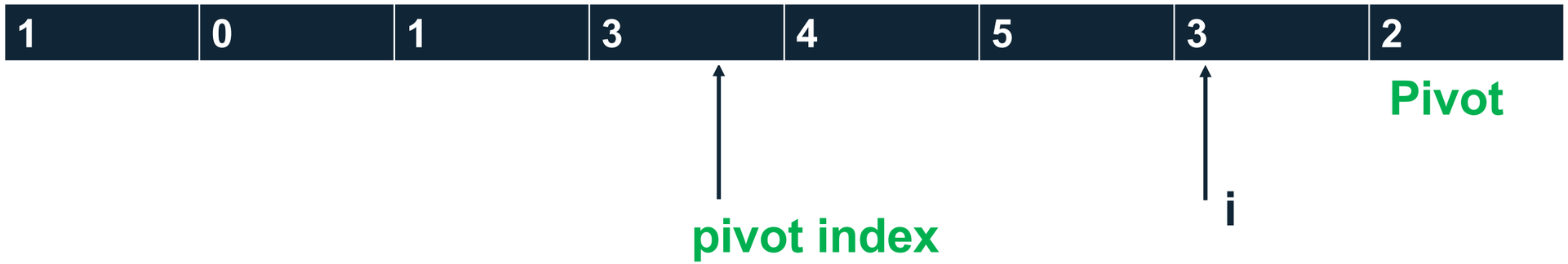

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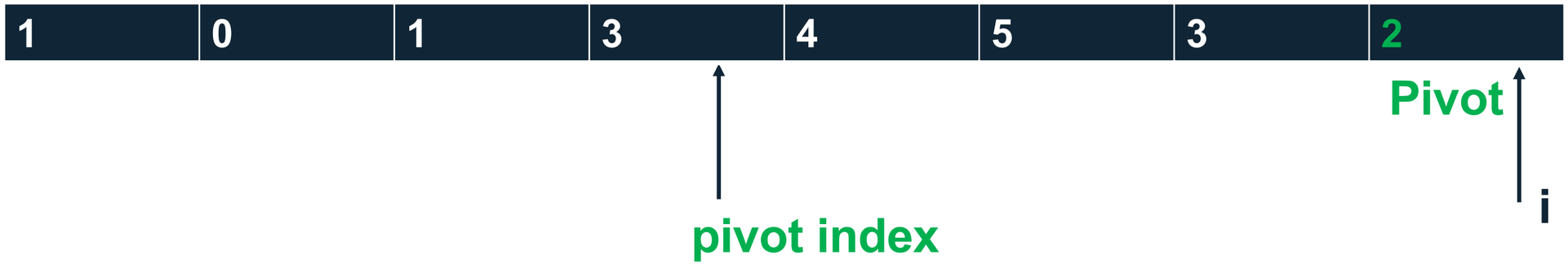

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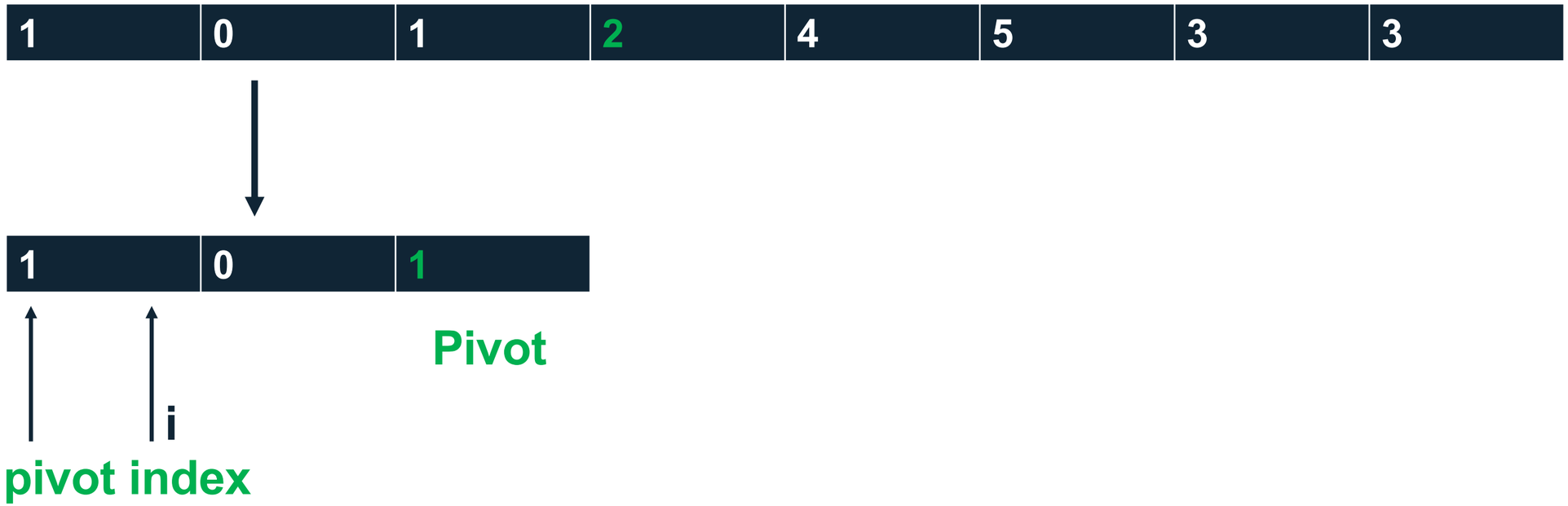

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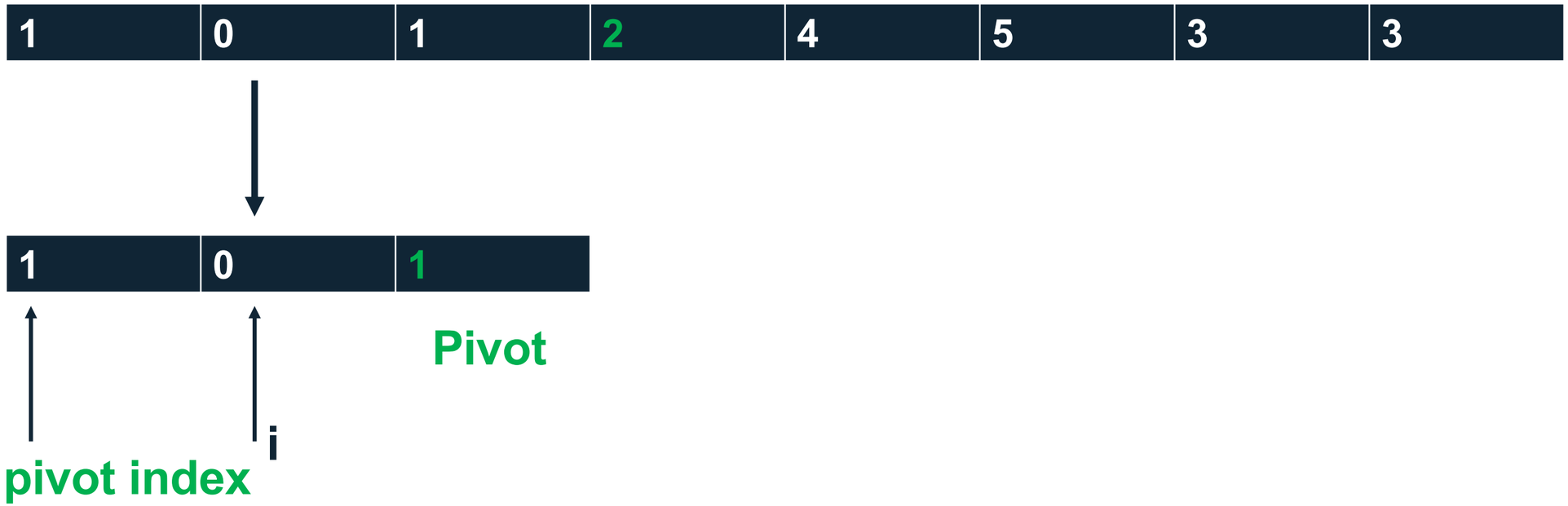

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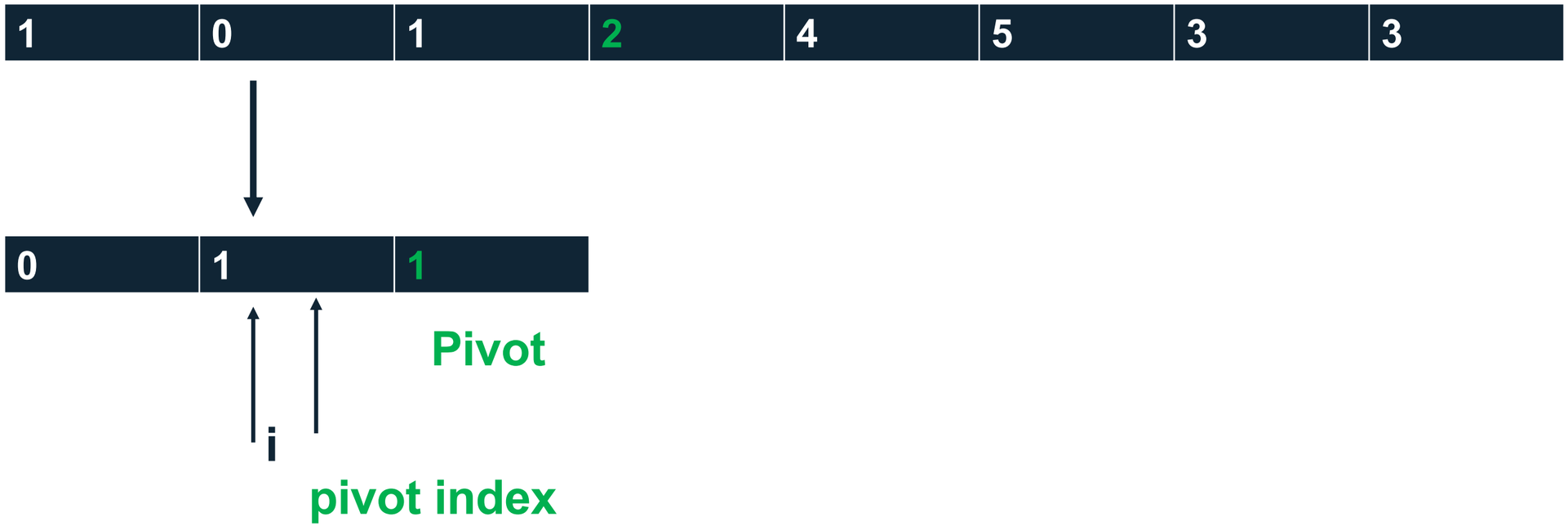

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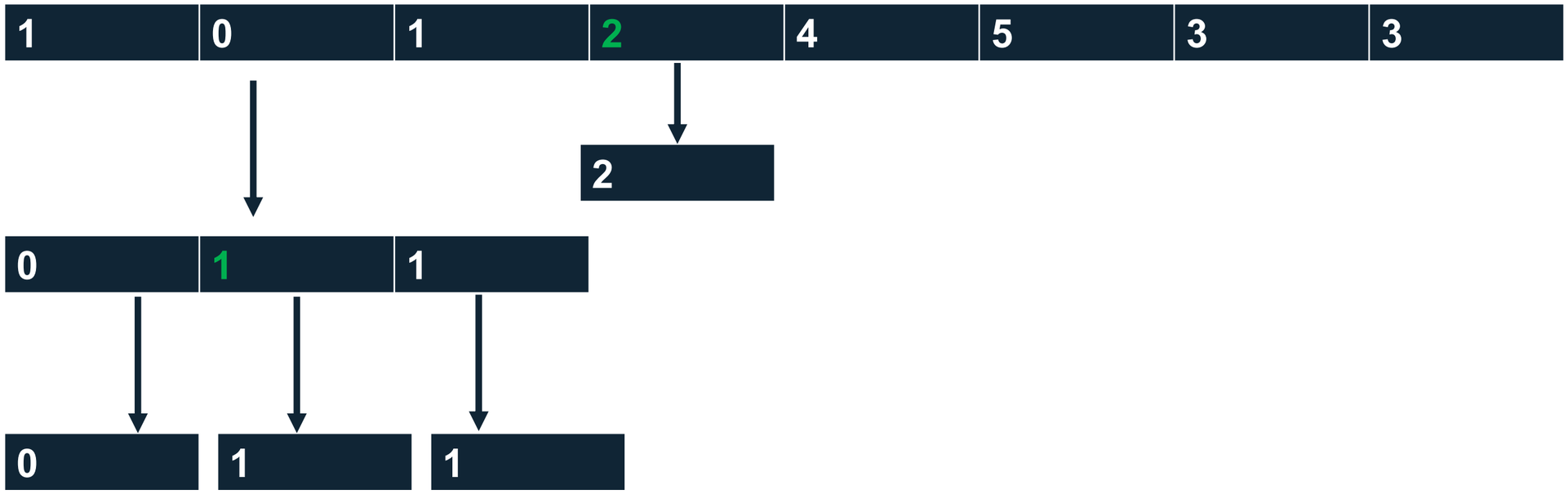

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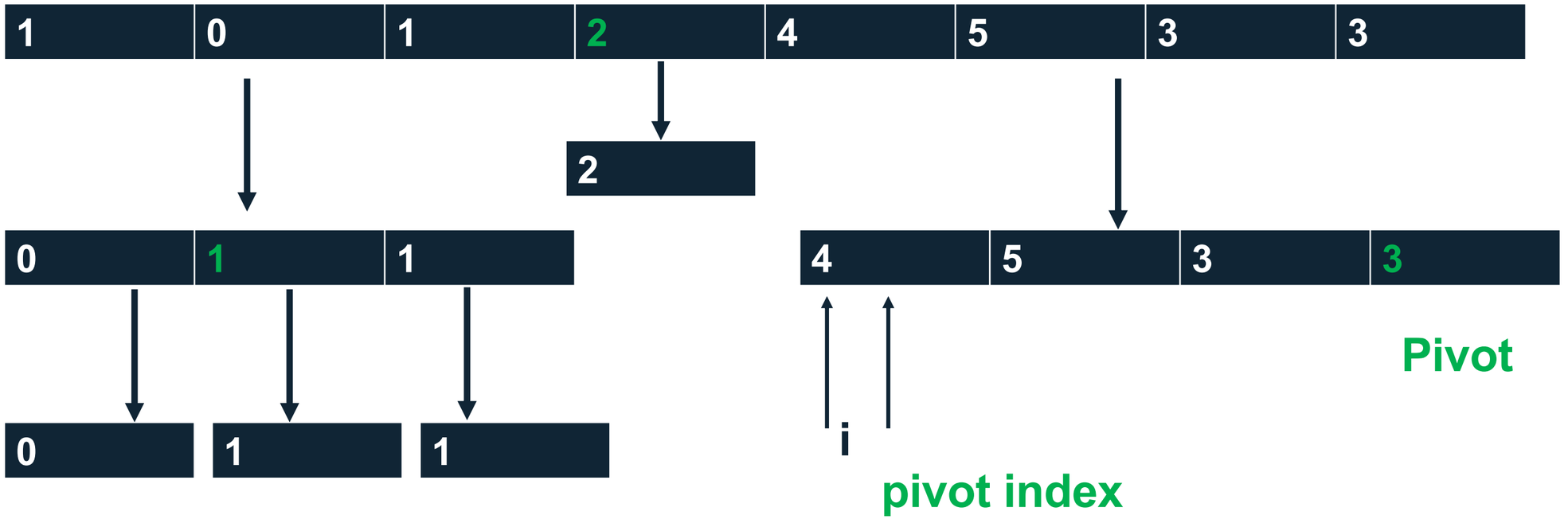

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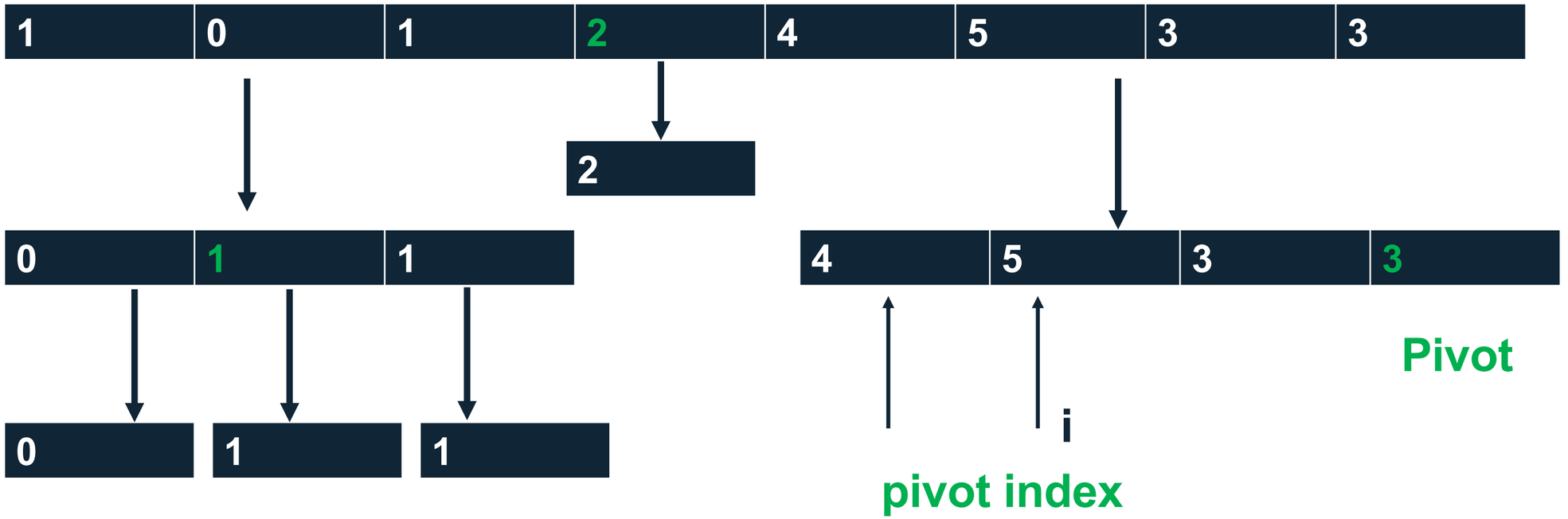

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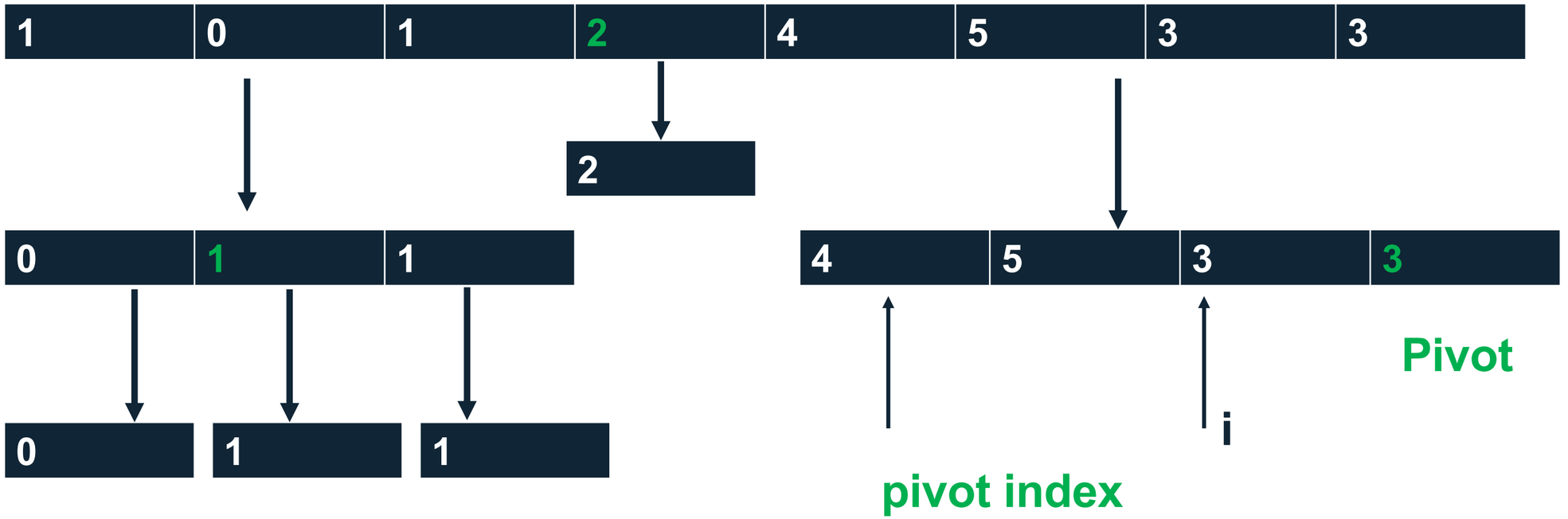

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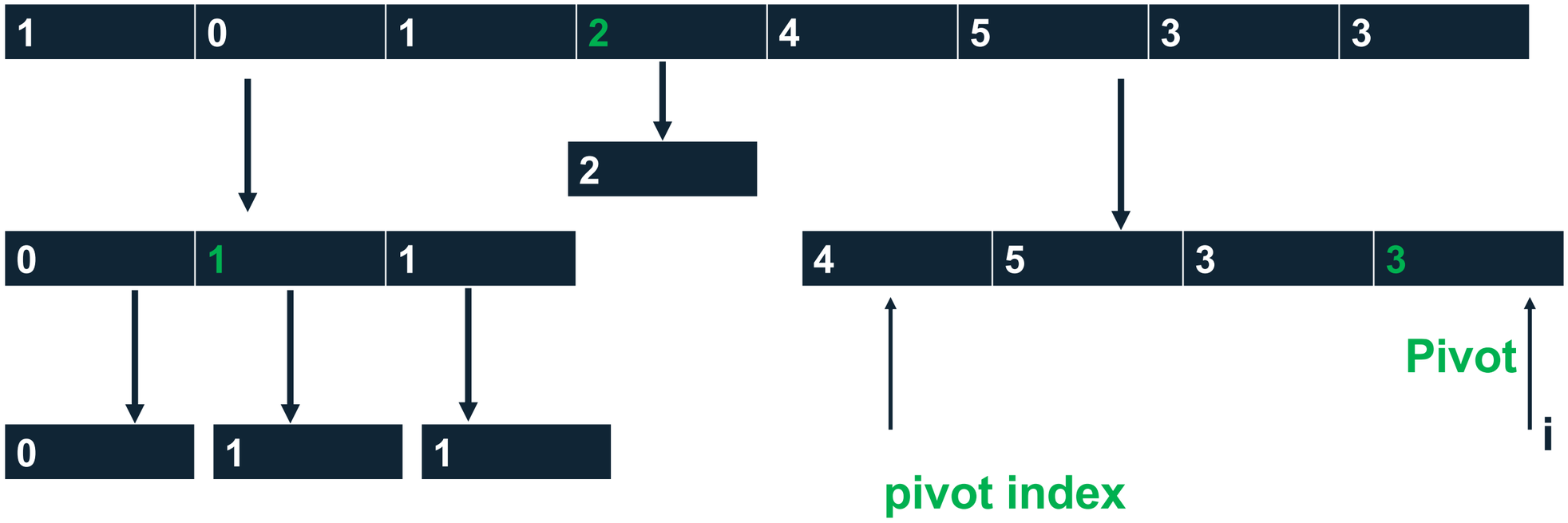

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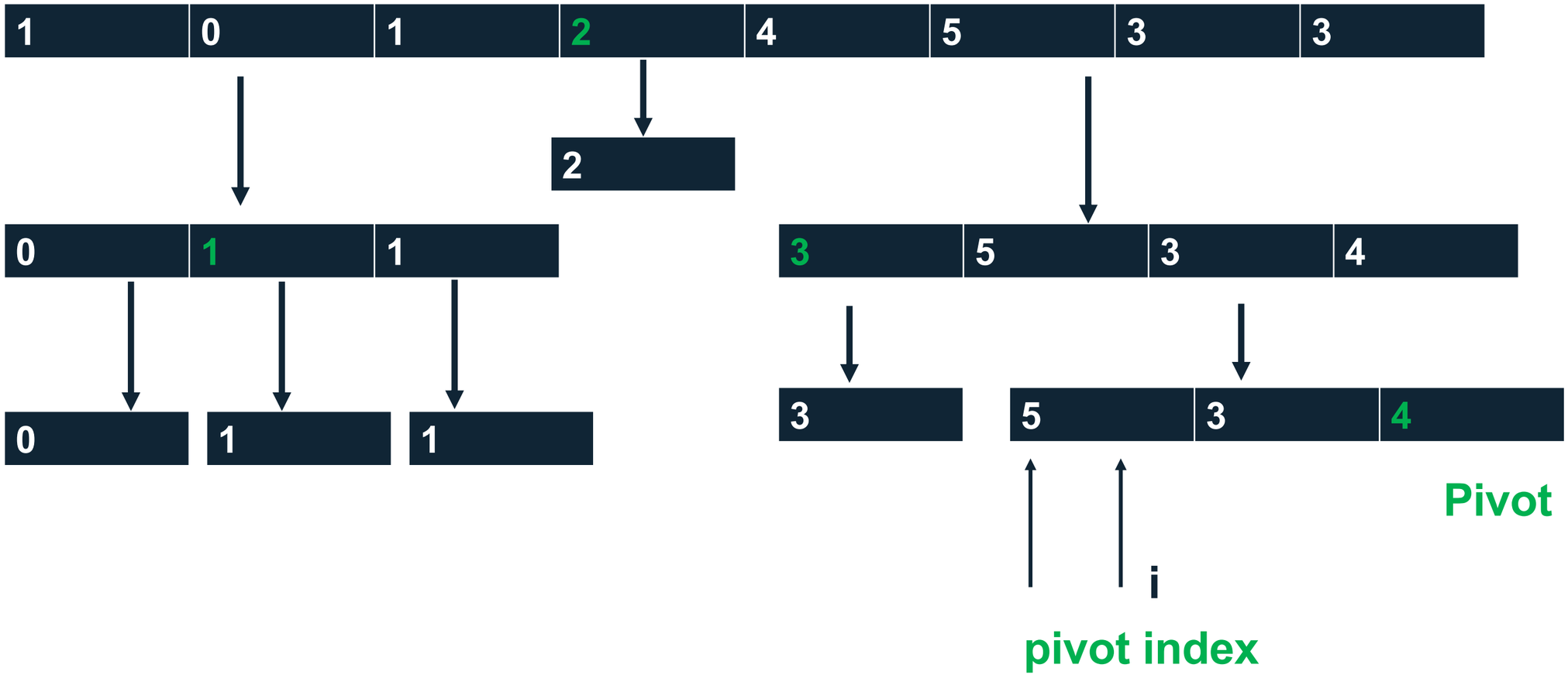

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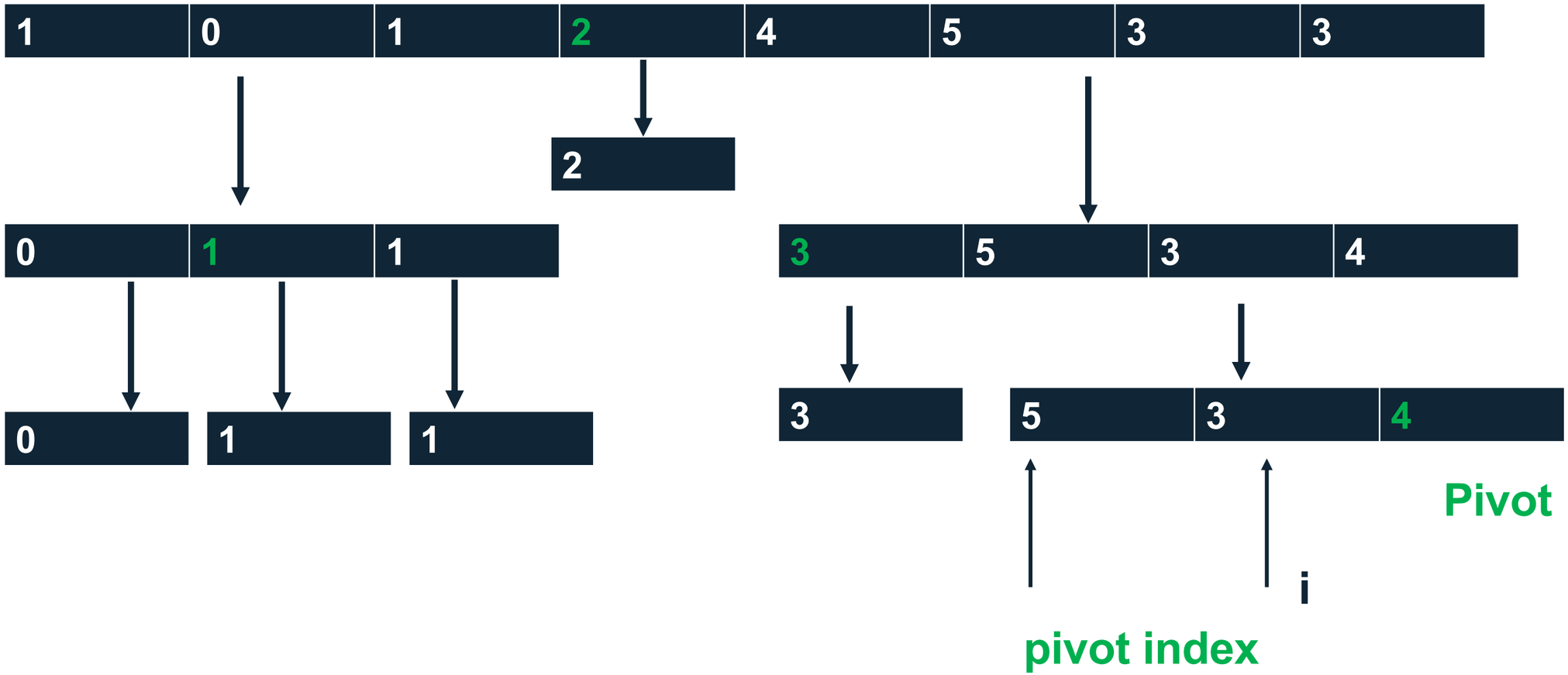

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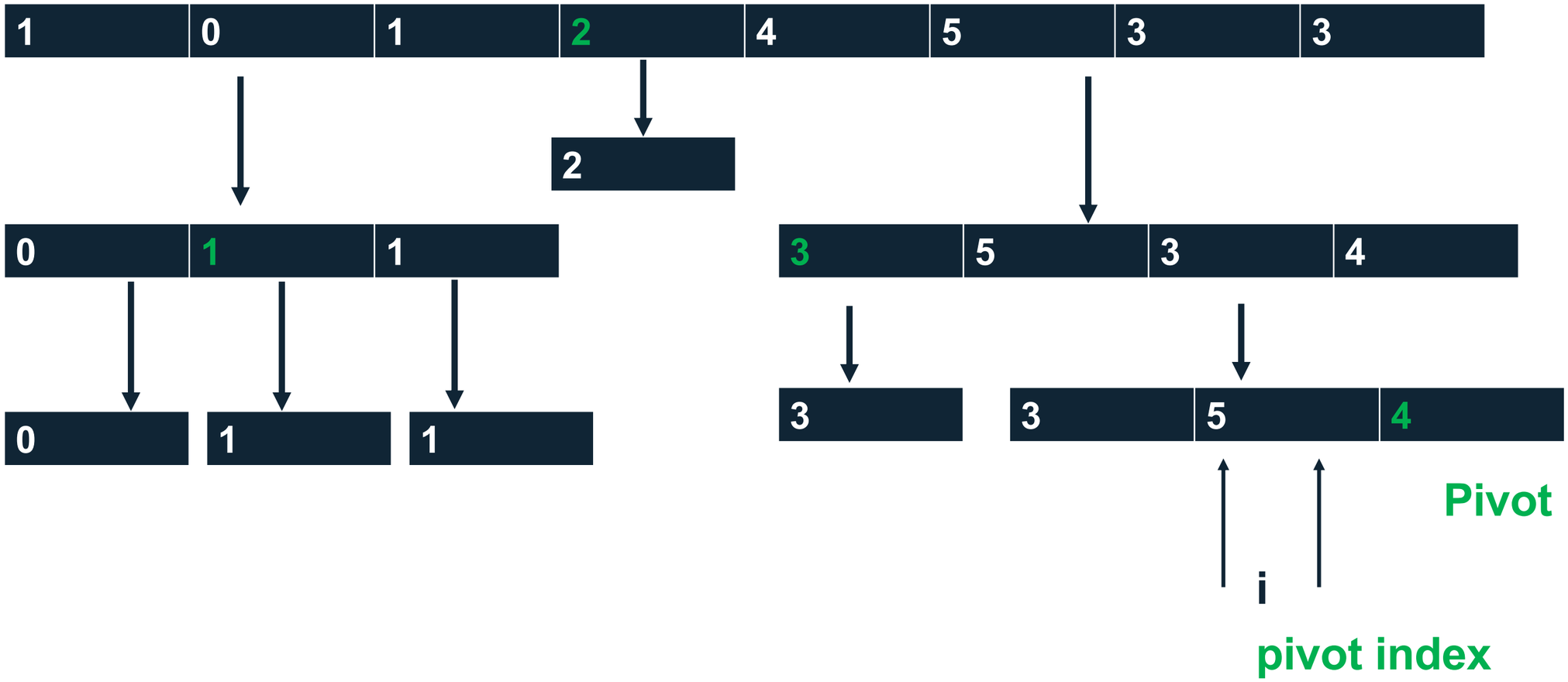

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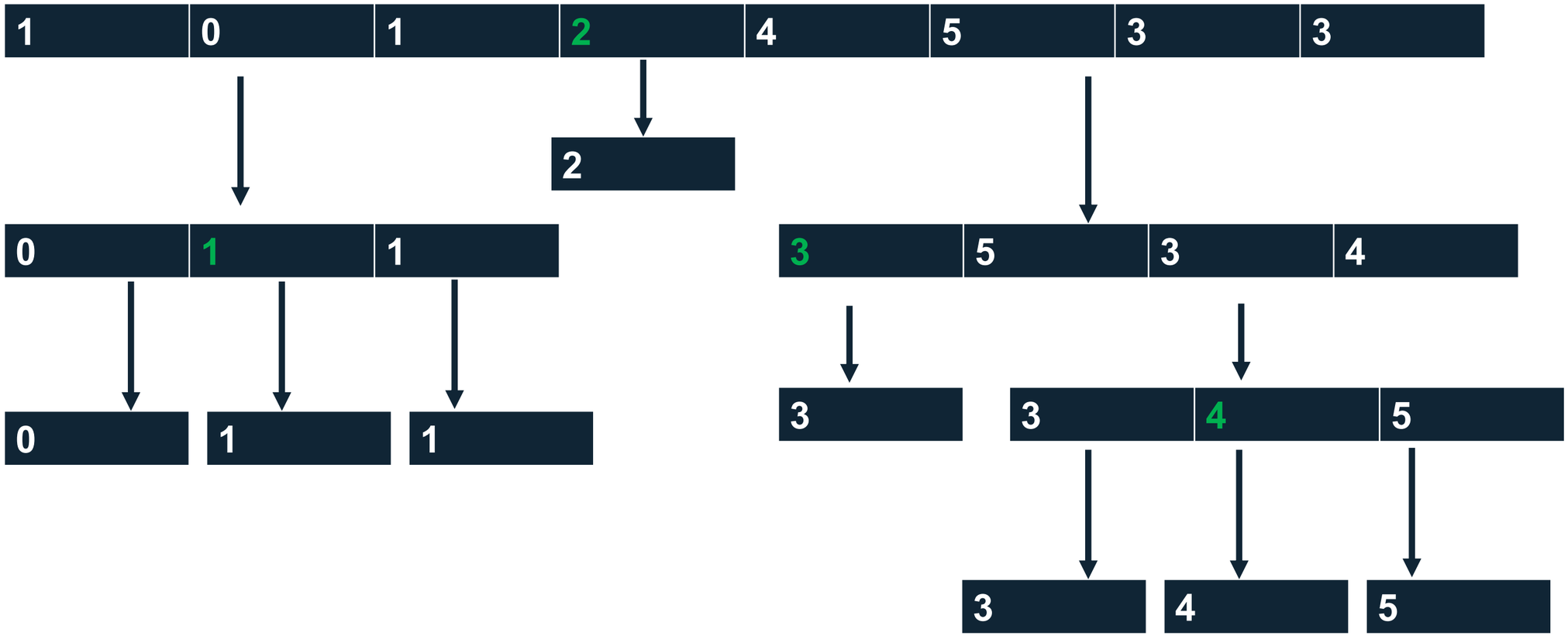

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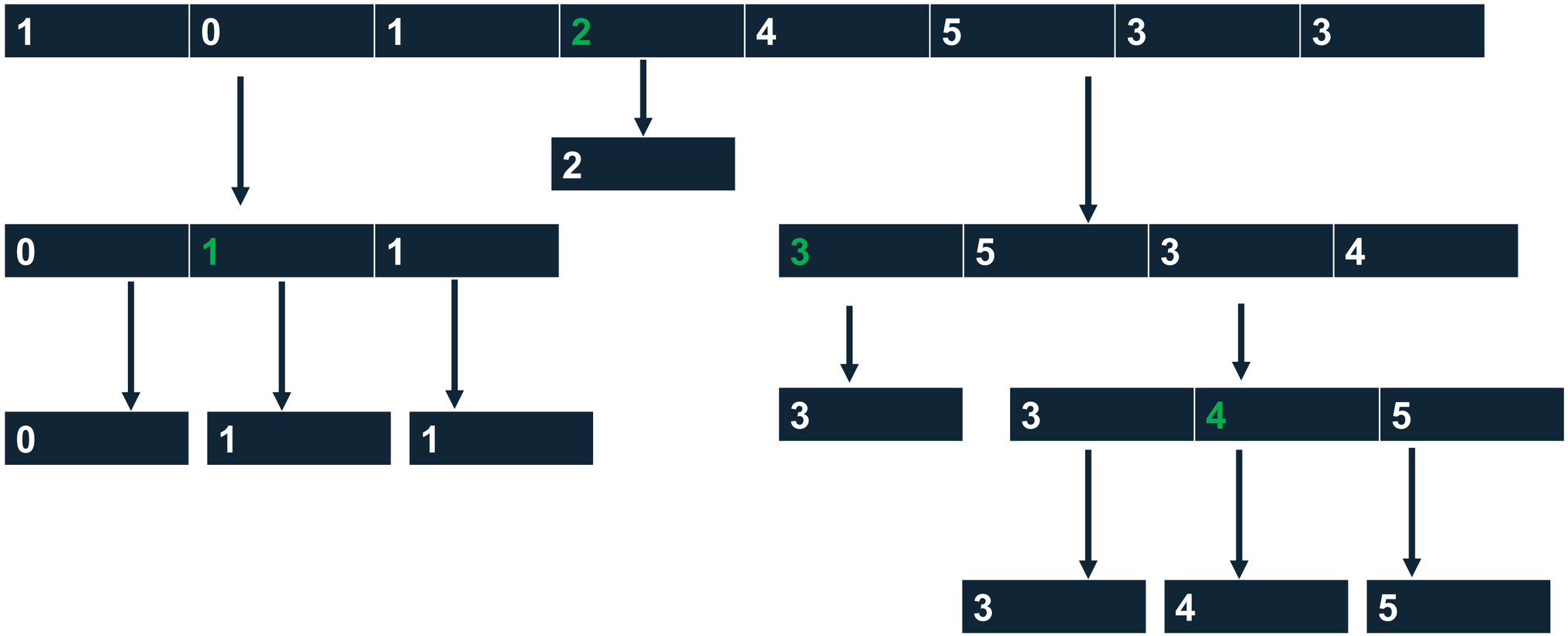

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Quick sort

```
void QuickSort::sort(vector<int>& array, int start, int end) {
     // Base case, nothing to sort
     if(start >= end) {
          return;
     }
     // Select the last element as pivot
     int pivot = array.at(end);

     int pivot_index = start;
     for(int i = start; i < end; i++) {
          if (array.at(i) < pivot) {
               // swap ith element and element at pivot_index
               …
               pivot_index++;
          }
     }
     // swap the pivot_index element and pivot
     …

     // call sort for subarrays
     sort(array, start, pivot_index - 1);
     sort(array, pivot_index + 1, end);
}
```

Quick sort

- The choice of pivot is essential.
- $O(n^2)$ is the complexity in the worst case.
- $O(n \log(n))$ is the complexity in best and average cases.