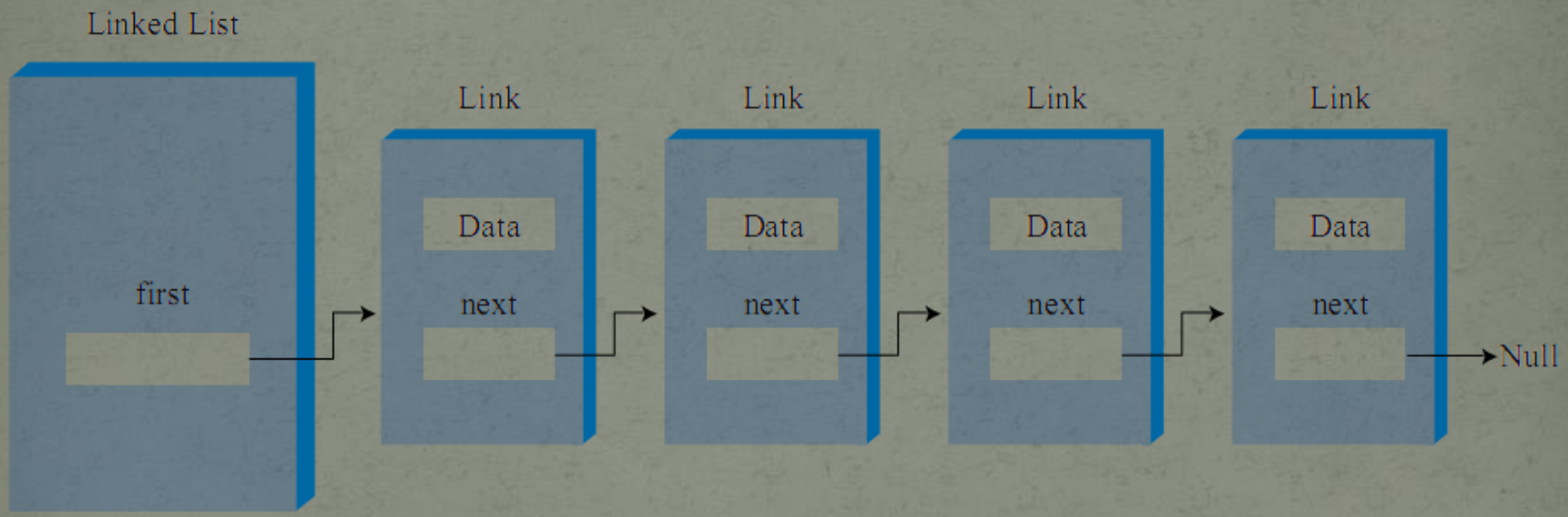
Algorithms and Data Structures

Andrzej Pisarski

Plan of the lecture

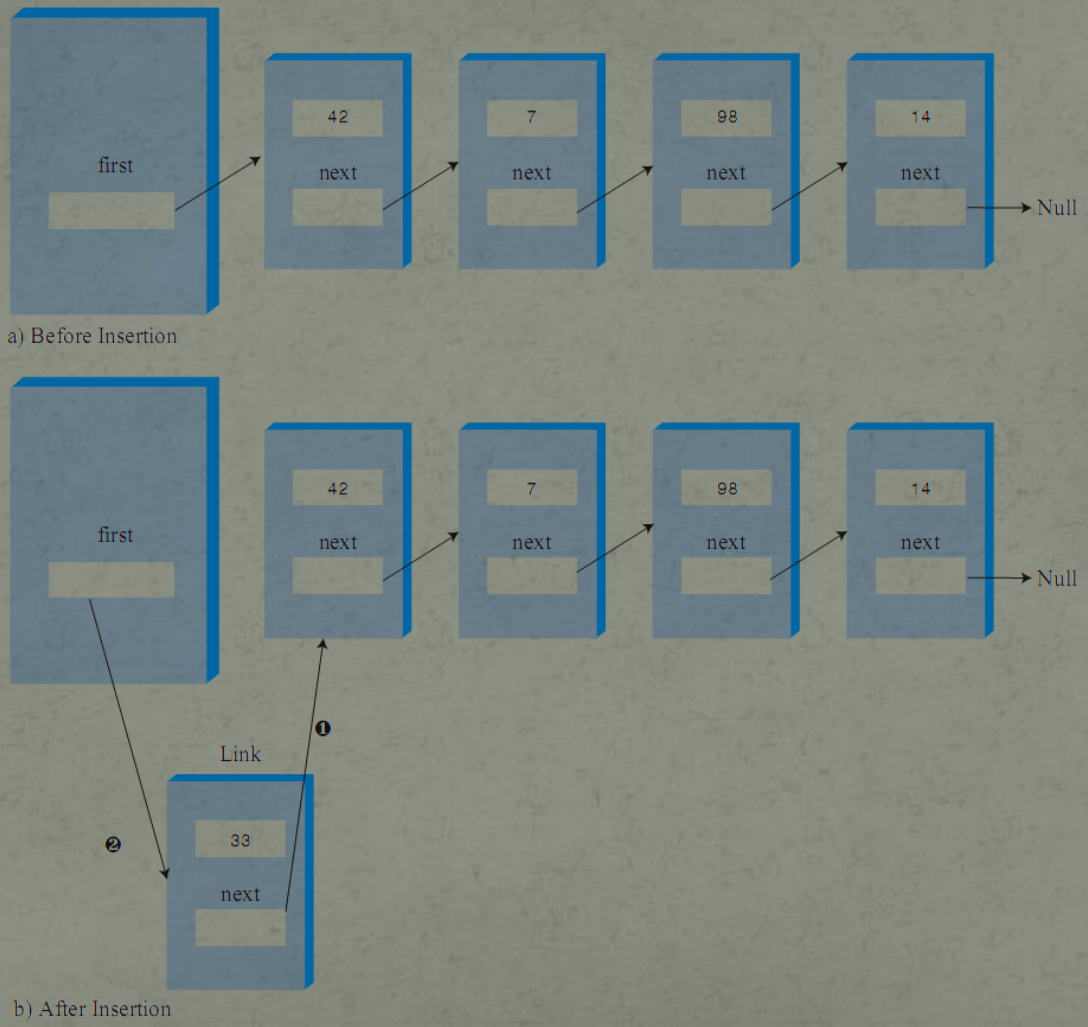
- Single-ended List
- Double-ended List
- Sorted List
- Specialized Lists: Doubly Linked List

Single-ended List



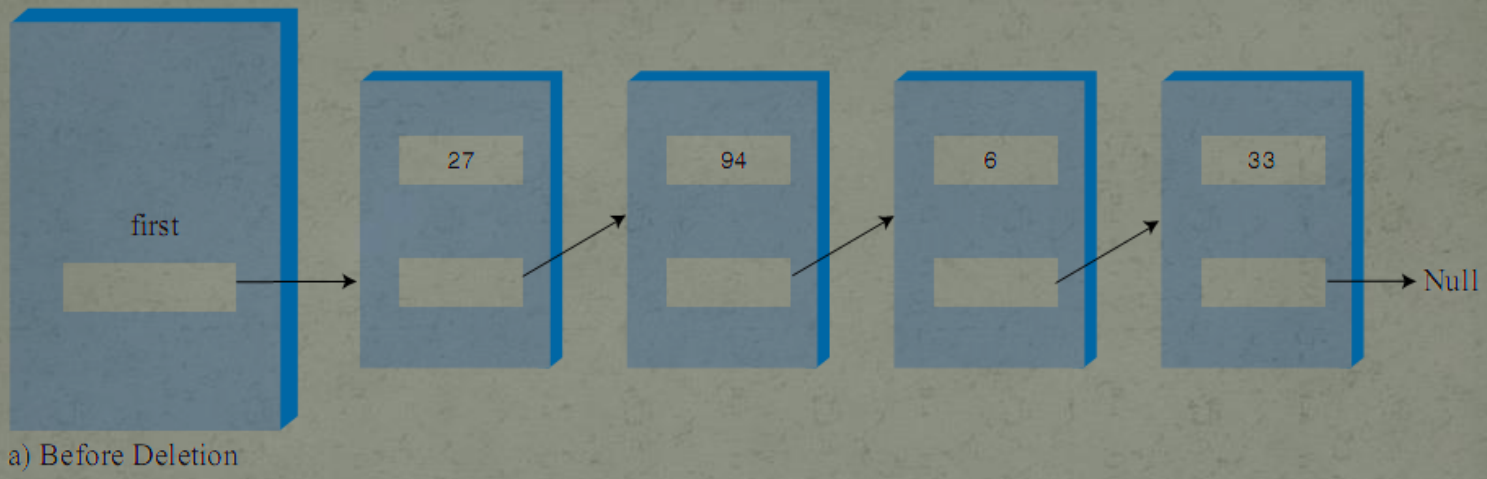
(*example from R. Lafore book*)

Single-ended List: insertion

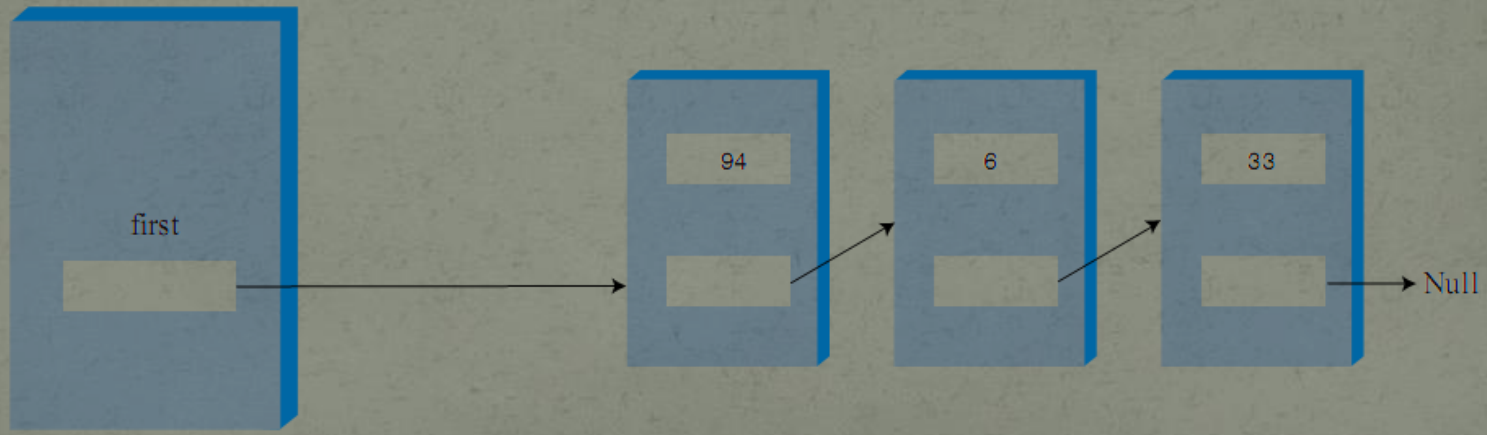


(*example from R. Lafore book*)

Single-ended List: deletion



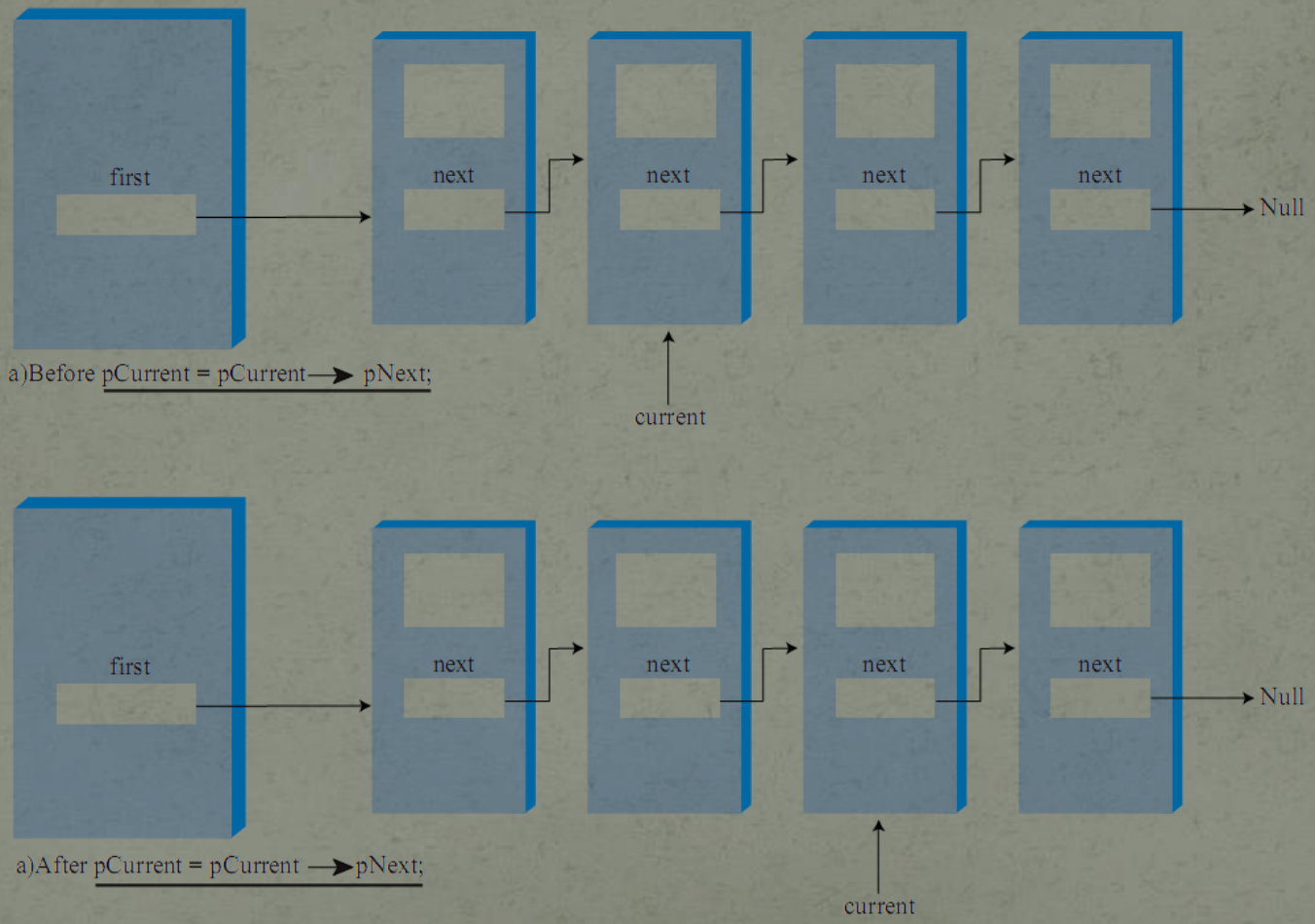
a) Before Deletion



b) After Deletion

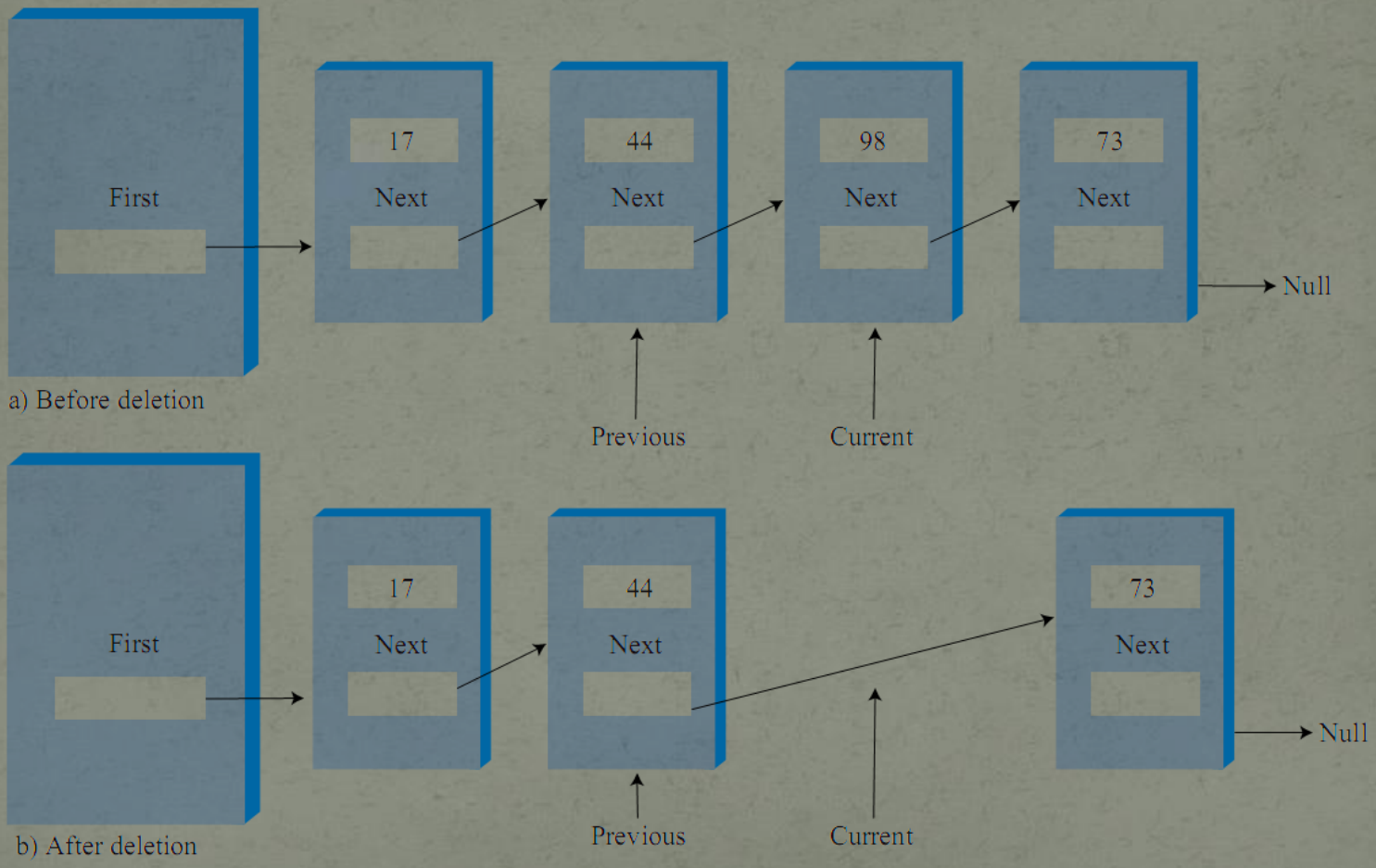
(*example from R. Lafore book*)

Single-ended List: stepping along the list



(*example from R. Lafore book*)

Single-ended List: removing the item



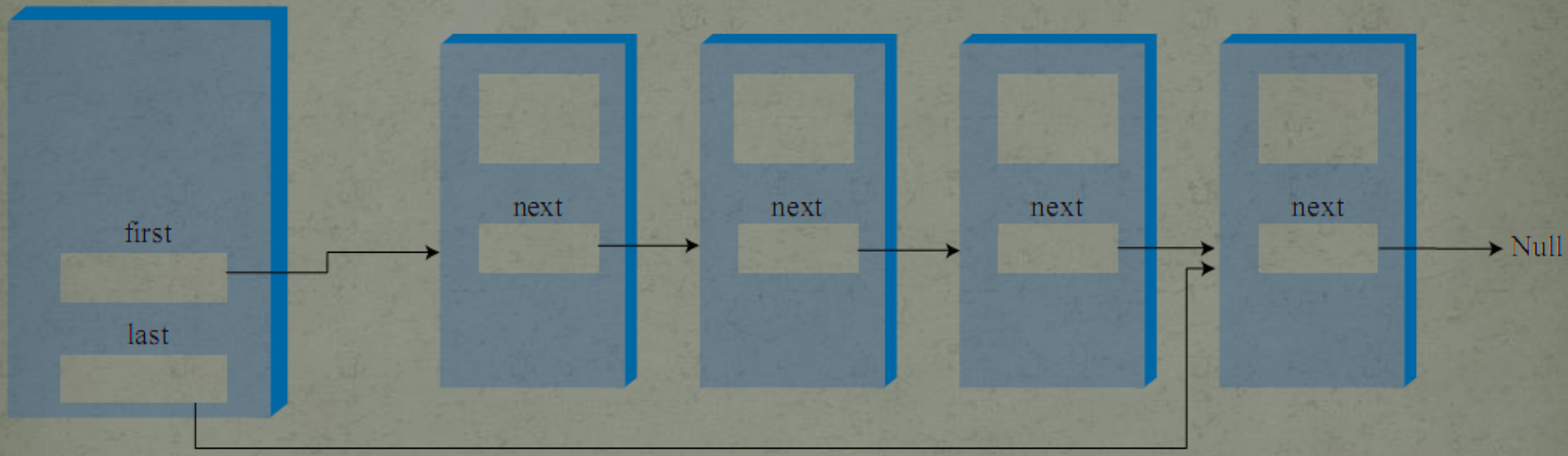
(*example from R. Lafore book*)

Single-ended List: efficiency

The Efficiency of Single-ended Lists

- Item at the beginning of a list can be inserted or deleted in O(1) time (do not depend how many items are in list).
- Searching or deleting specified key value can be done in O(N) time (average N/2) – to find a data we need to going through all the elements. There is no need to move data as it is with Arrays.

Double-ended List

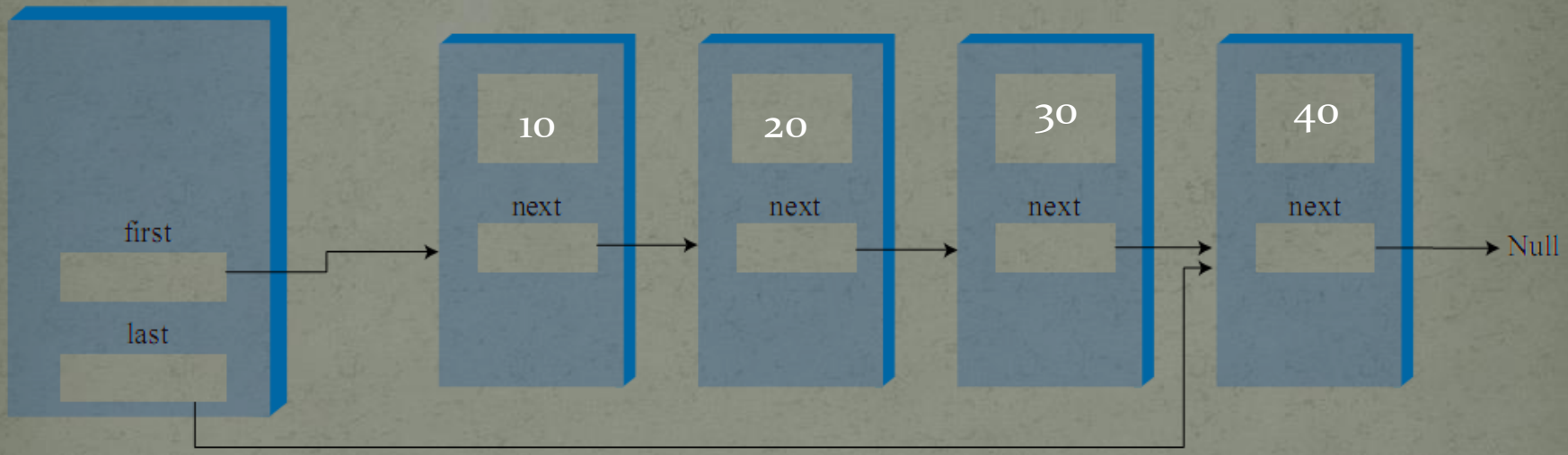


(*example from R. Lafore book*)

Double-ended List: insertion

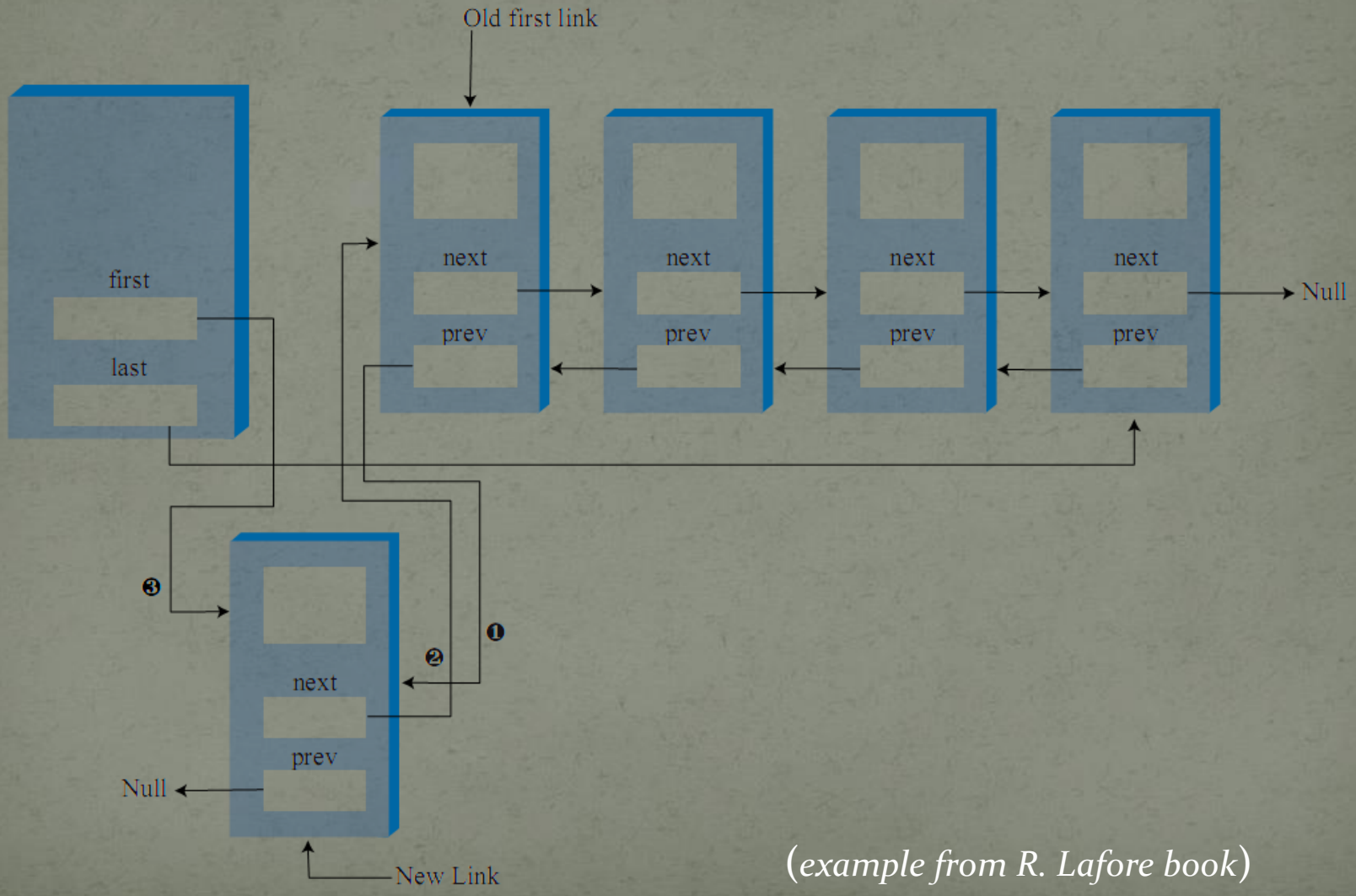
(*example from R. Lafore book*)

Sorted List (single- or double–ended list)



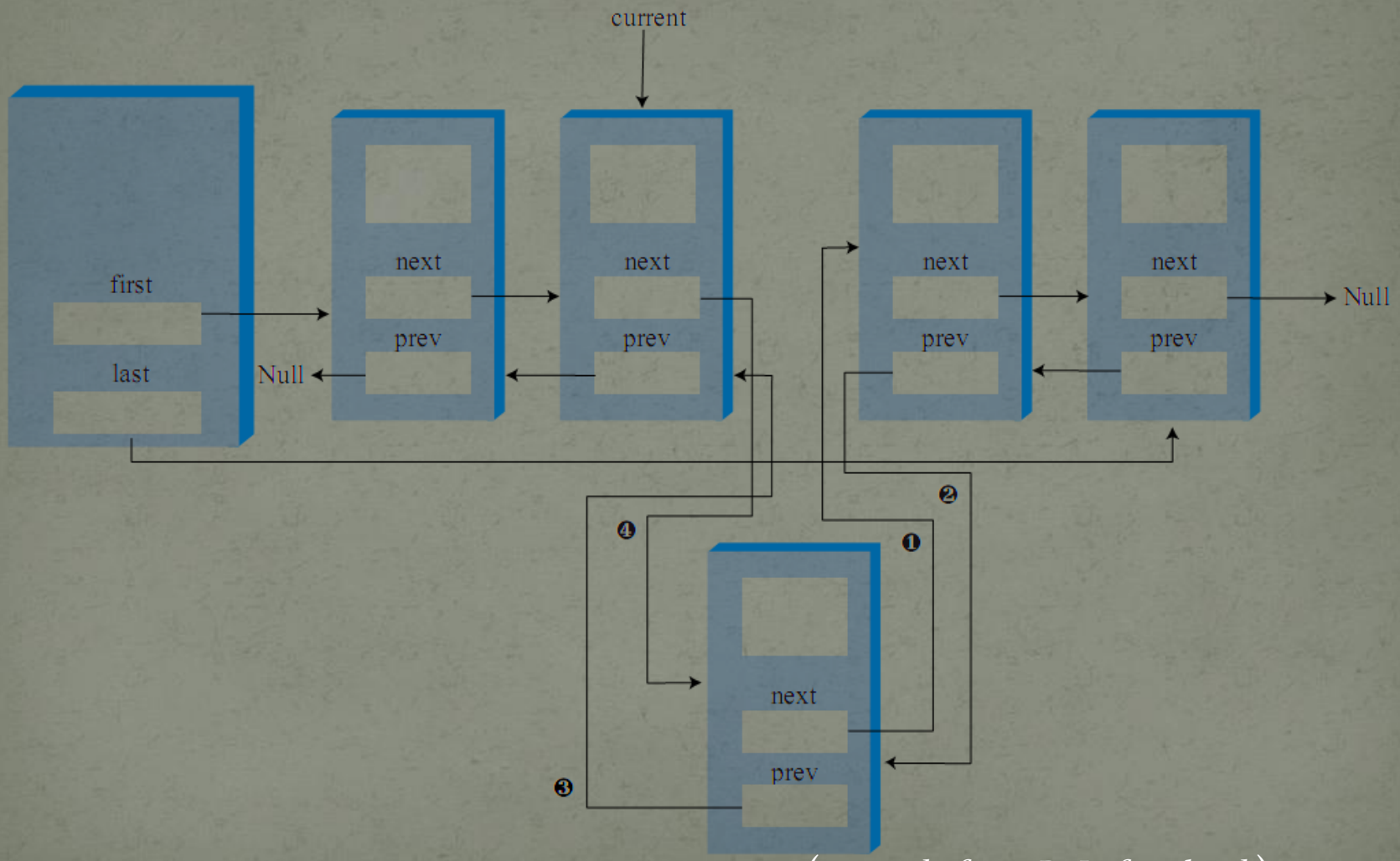
(*example from R. Lafore book*)

Specialized Lists: Doubly Linked List (inserting an item)



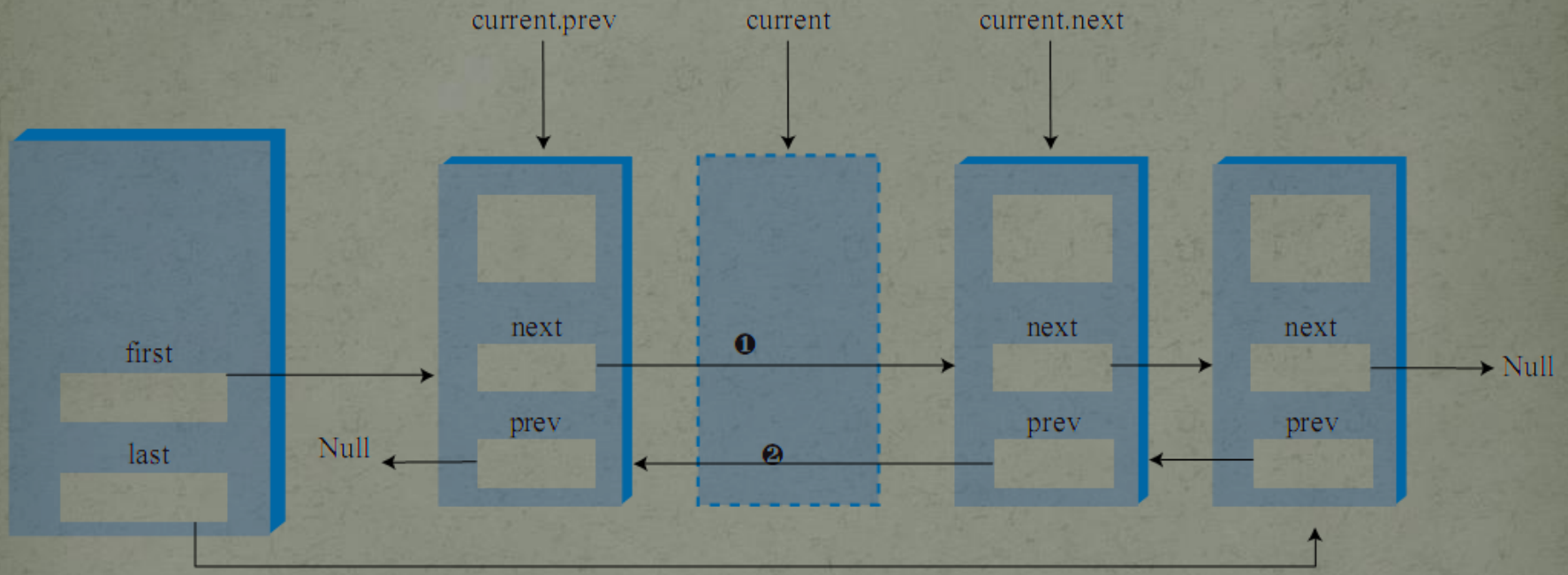
(*example from R. Lafore book*)

Specialized Lists: Doubly Linked List (inserting an item)



(*example from R. Lafore book*)

Specialized Lists: Doubly Linked List (deleting an item)



(*example from R. Lafore book*)