

Data Structures

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- Deque

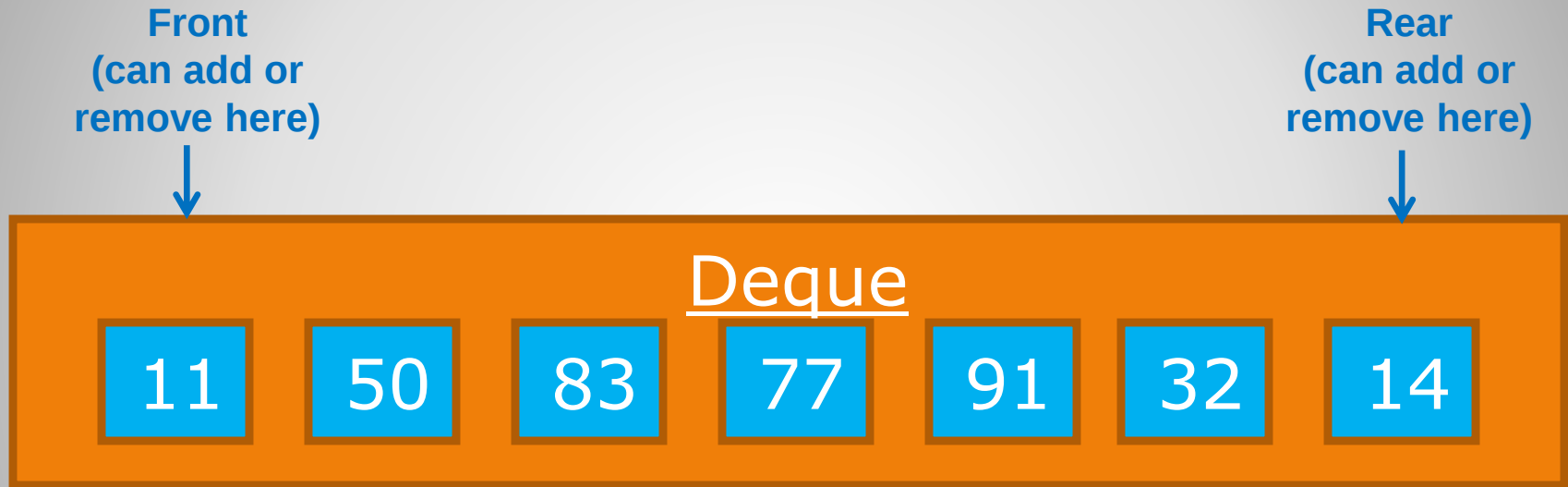
Today's Lecture

Deque

- Double-ended queue.
- Allows insertion at both ends of a queue.
- Allows deletion at both ends of a queue.
- Operations
 - addFront
 - addRear
 - removeFront
 - removeRear
 - getFrontData
 - getRearData

Deque

- Here is a picture of a deque.
- Can add and remove at both ends



Deque

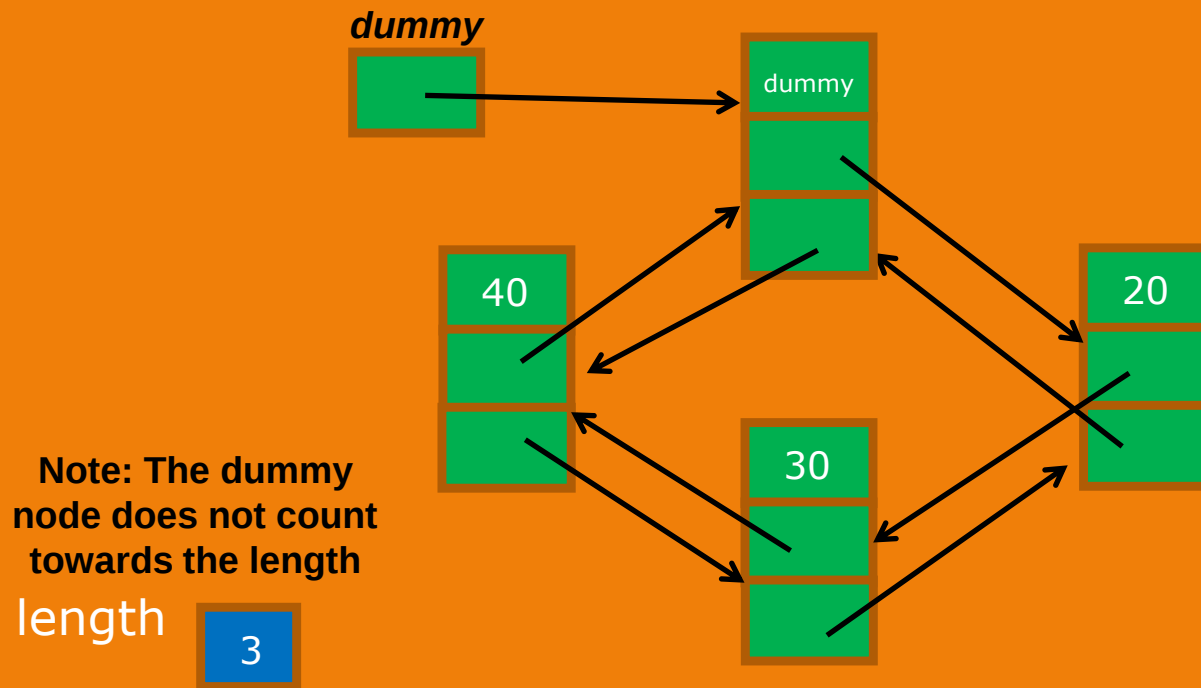
Deque Implementations

- Doubly-linked list implementation.
 - Can implement using a circular doubly-linked list with a dummy node.
- Array-based implementation.

Deque

- What is the front? `front = dummy.next;`
- What is the rear? `rear = dummy.previous;`

Deque Using a Circular Doubly-linked List w/ Dummy



Deque - Circular Doubly-linked List w/ Dummy

Operation	Cost
addFront	$O(1)$
addRear	$O(1)$
removeFront	$O(1)$
removeRear	$O(1)$
getFrontData	$O(1)$
getRearData	$O(1)$

Deque – Big O

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