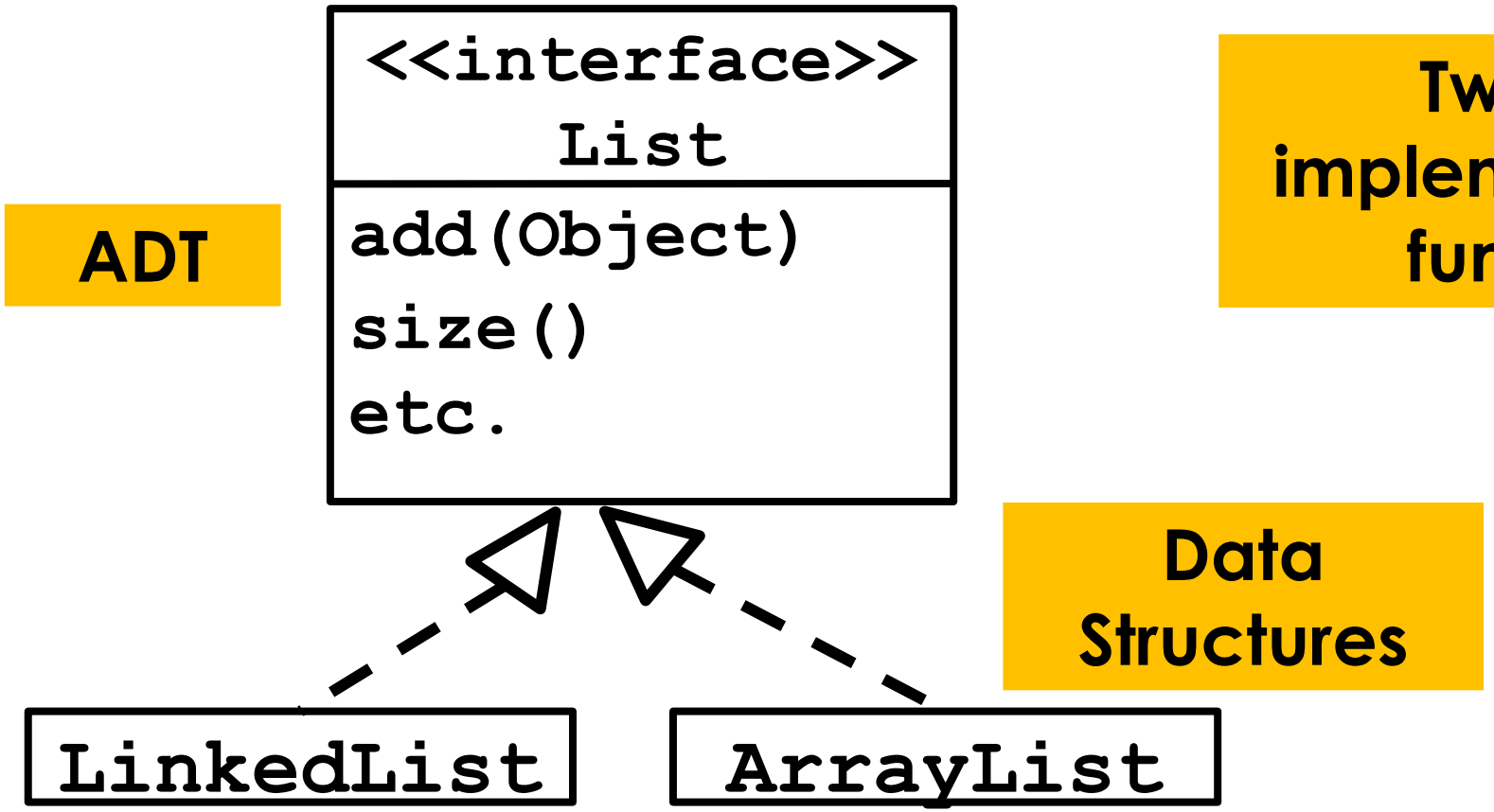
Implementing the List Interface

From ArrayLists to LinkedLists

By the end of this video you will be able to…

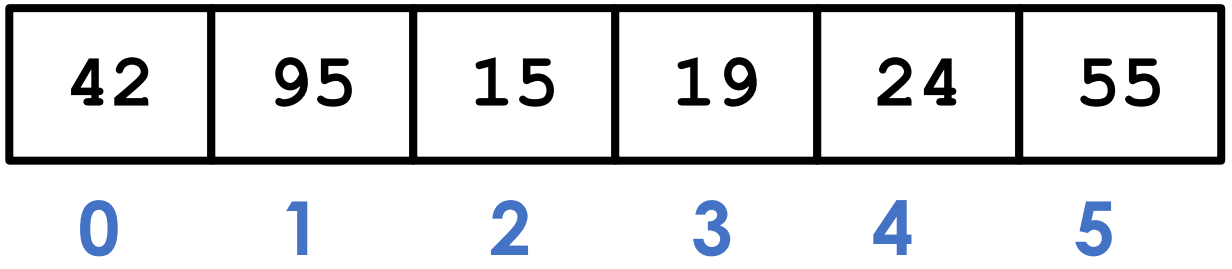
- Describe and draw the structure of a LinkedList
- Describe an advantage of a LinkedList over an ArrayList

ADT



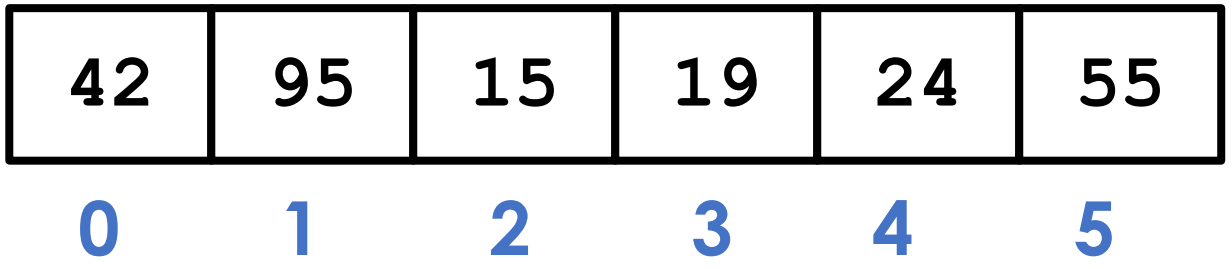
Data Structures

Two ways to implement the same functionality!



An ArrayList implements the List interface using an array

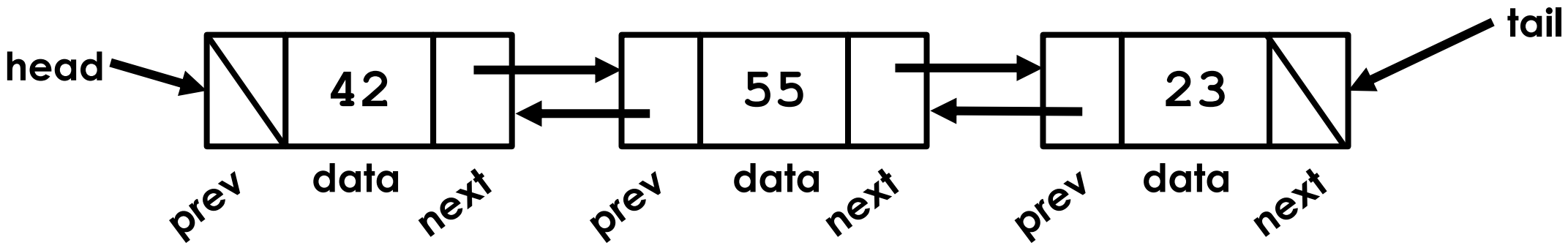
How long does it take to add an element to the front of an ArrayList?



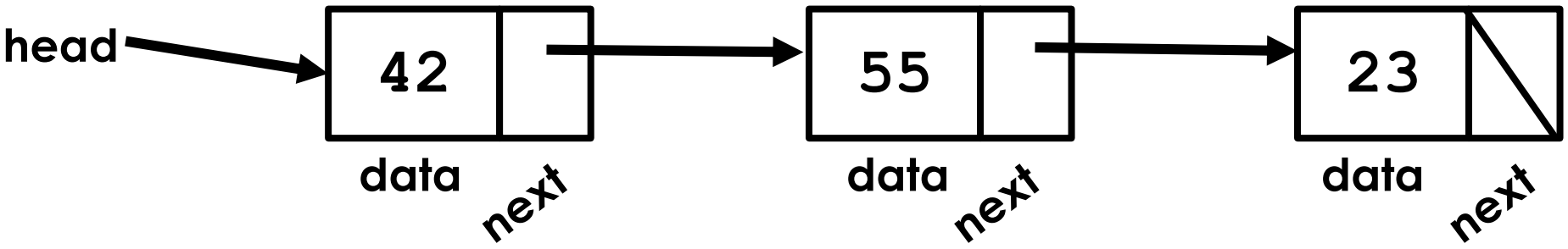
An ArrayList implements the List interface using an array

ADT specifies functionality, but not efficiency!

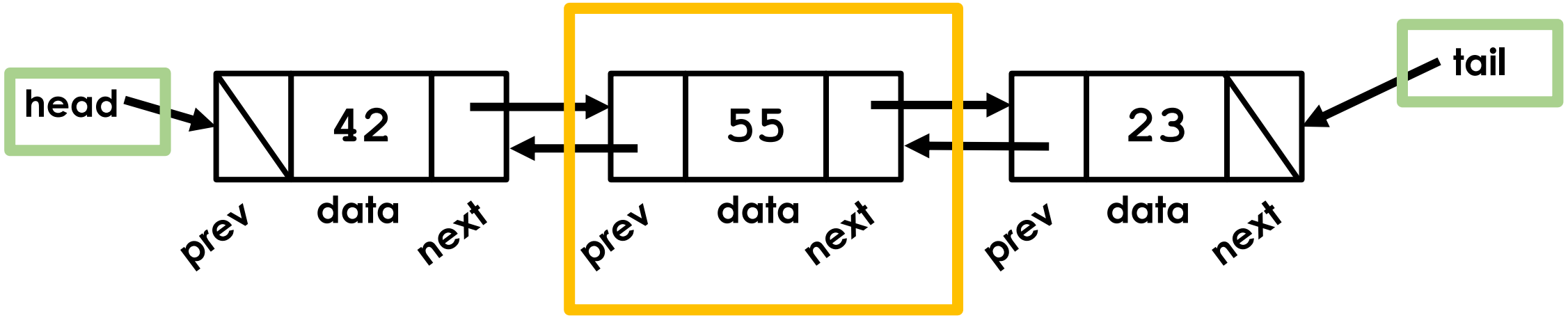
(Doubly) Linked List, in pictures



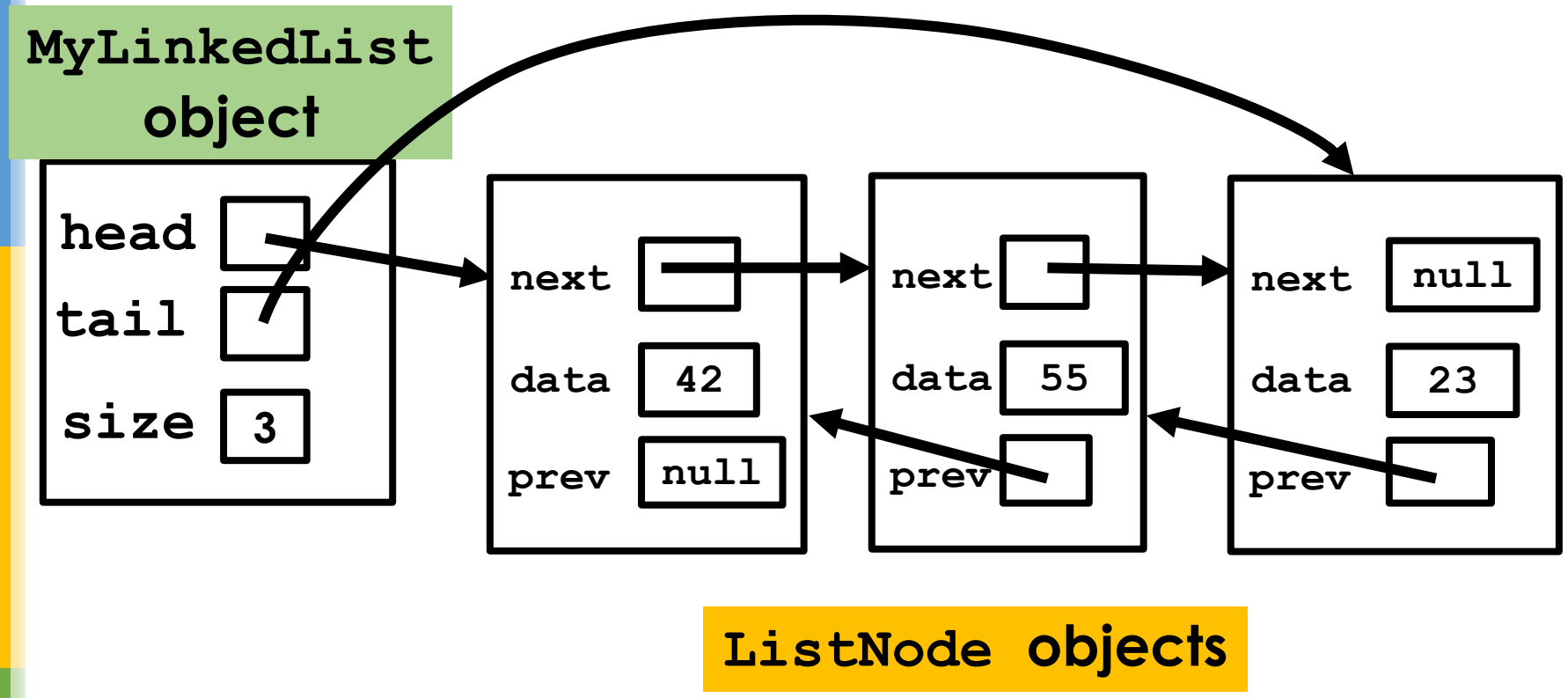
Singly Linked List, in pictures



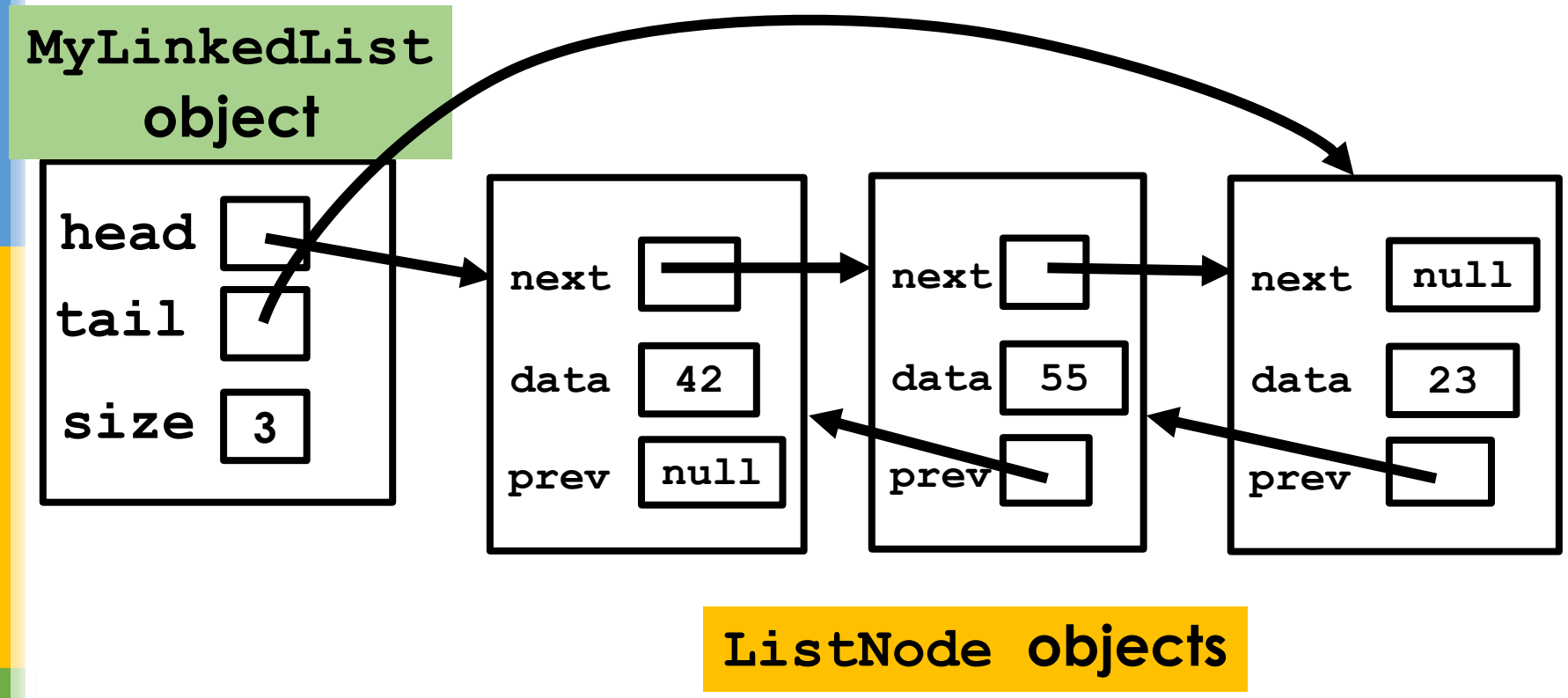
Two classes in a LinkedList



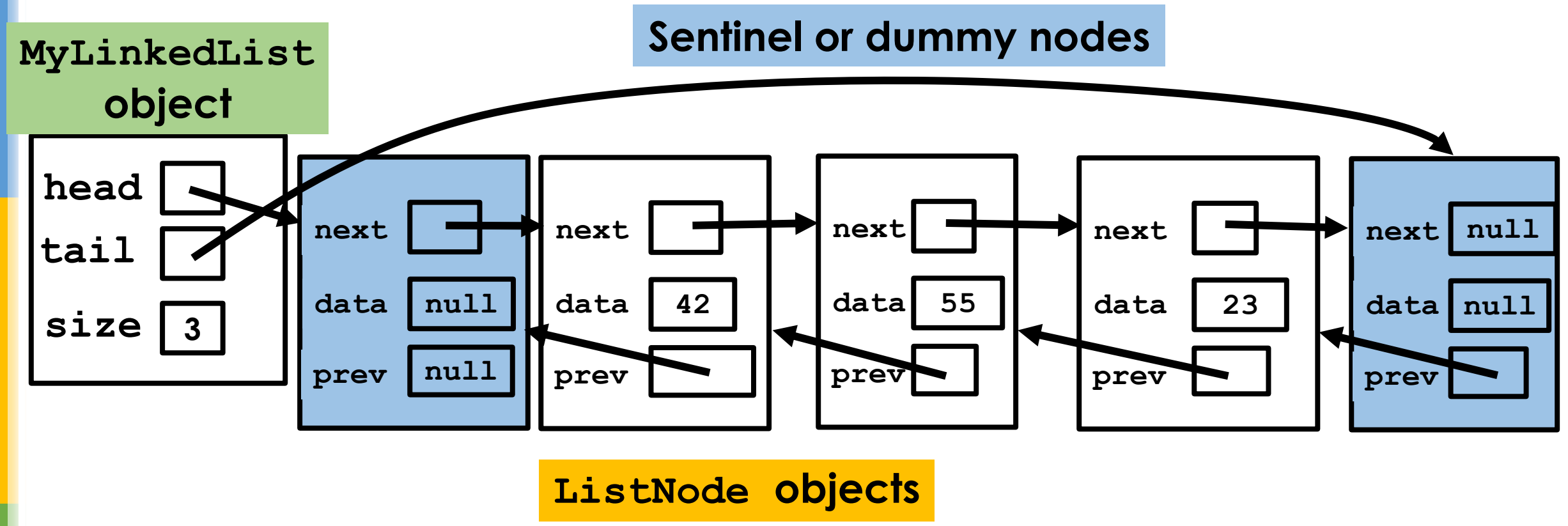
Two classes in a LinkedList

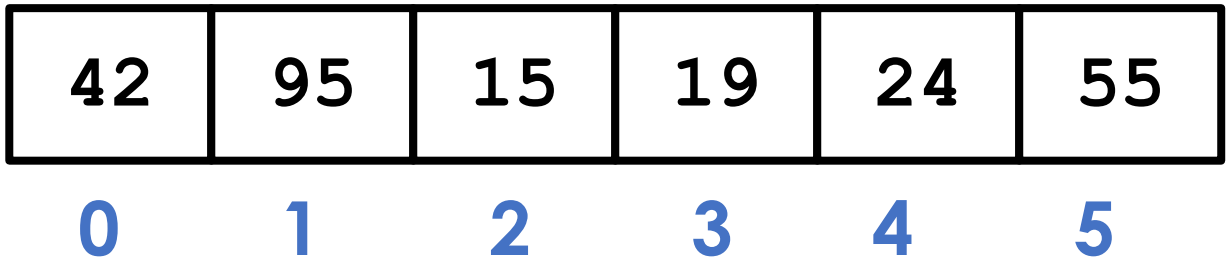


Alternate Implementation: Sentinel nodes



Alternate Implementation: Sentinel nodes

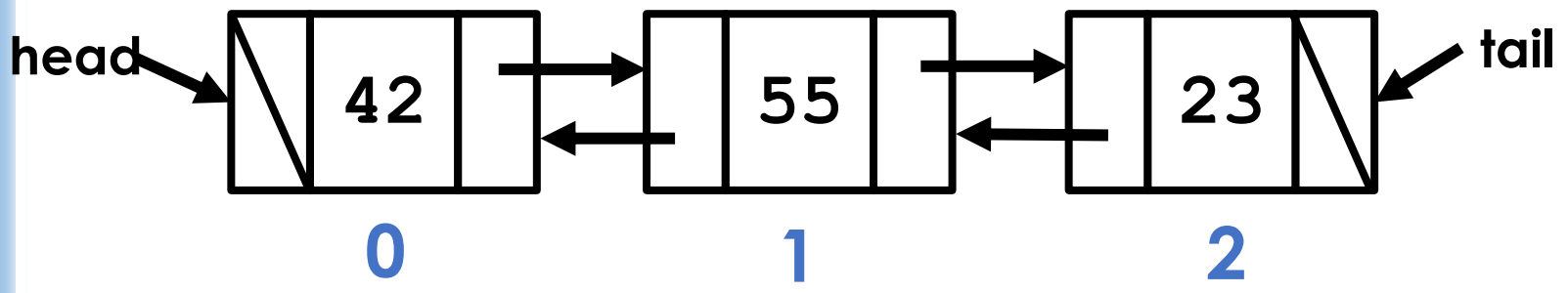




An ArrayList implements the List interface using an array

How long does it take to get an element at a particular index in an ArrayList

O(1)



A LinkedList implements the List interface using a LinkedList data structure

How long does it take to get an element at a particular index in a LinkedList

O(N)