



# ADT & Implementation

## **Queues**

COMP128 Data Structures

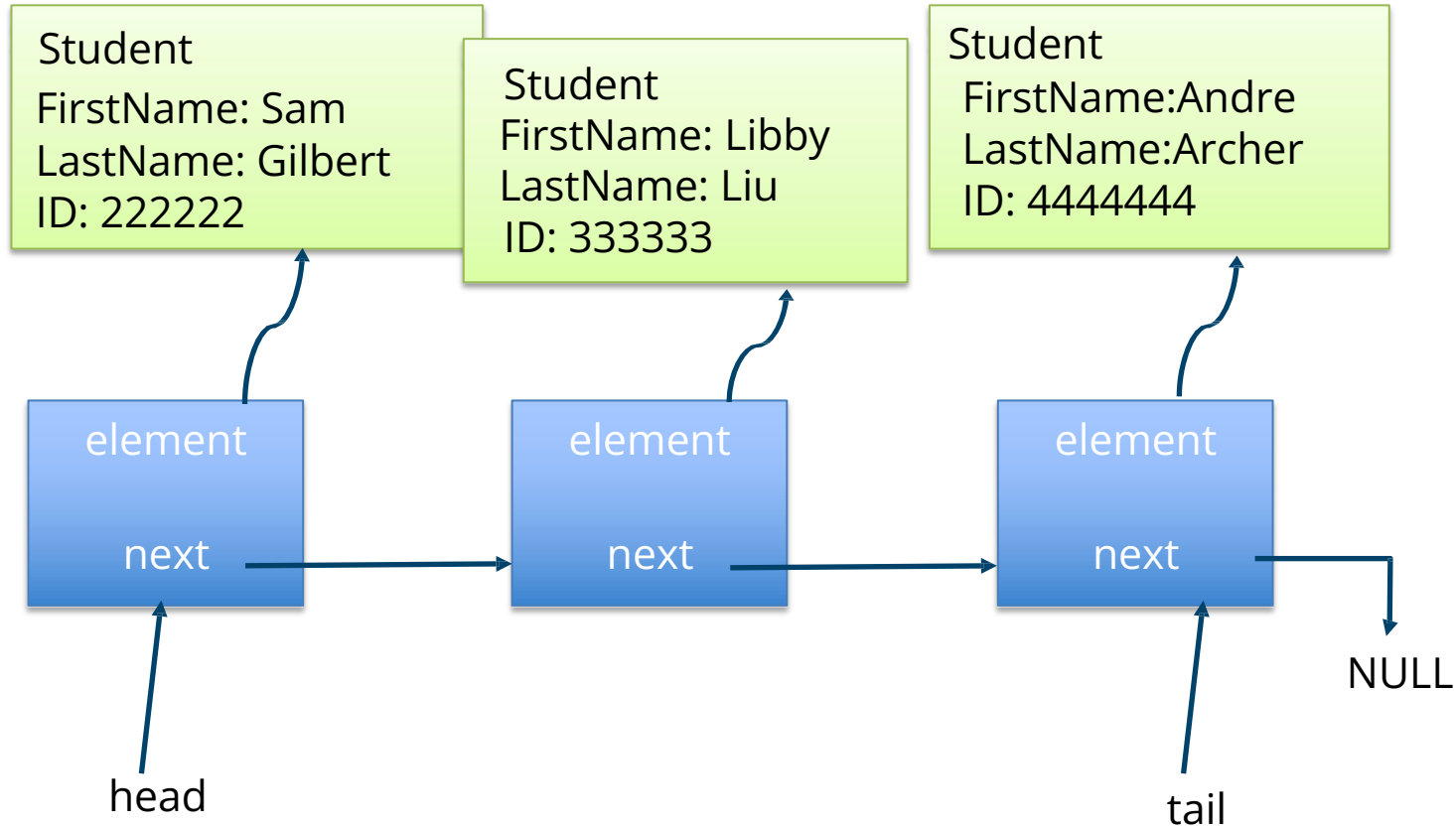


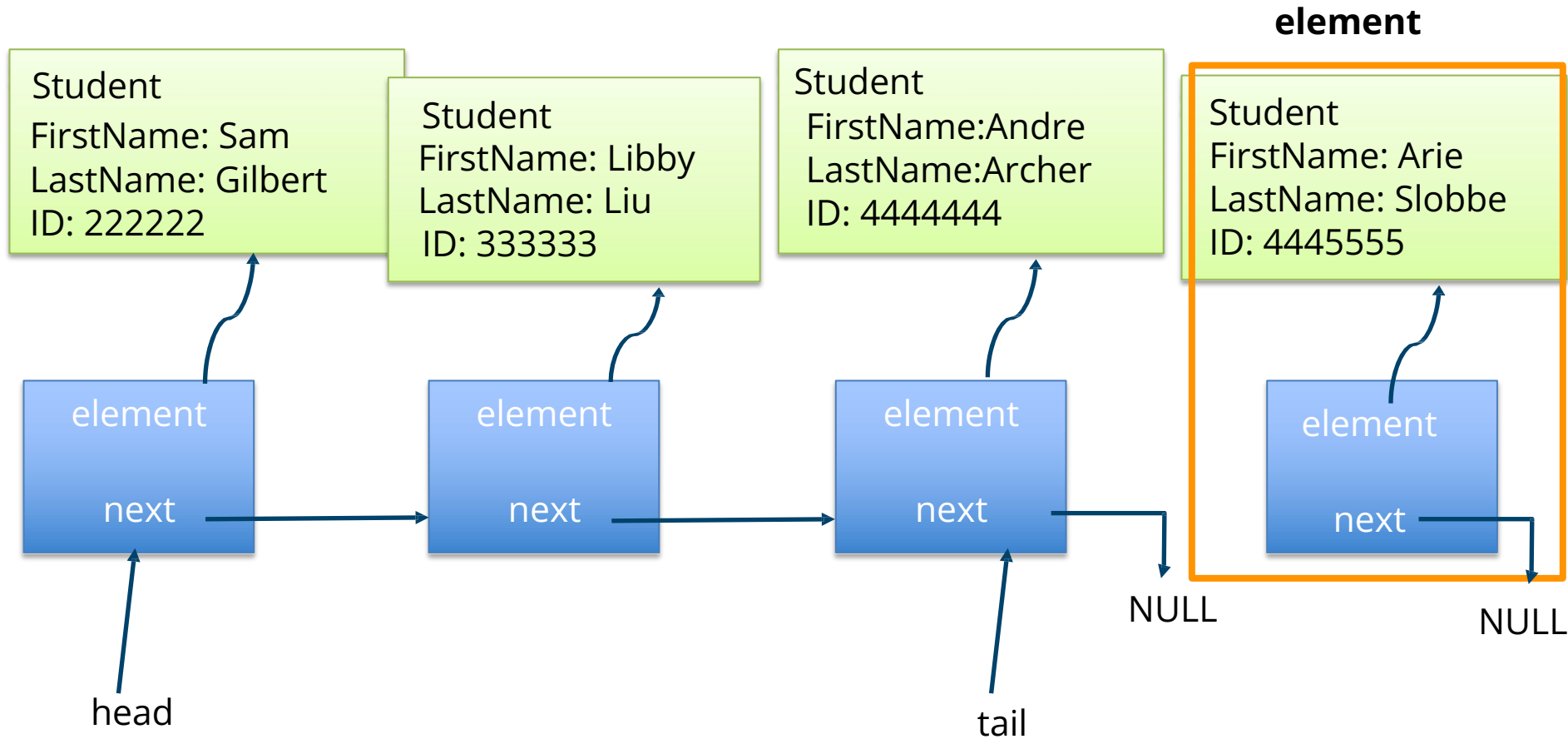
# Exam 1 Overview

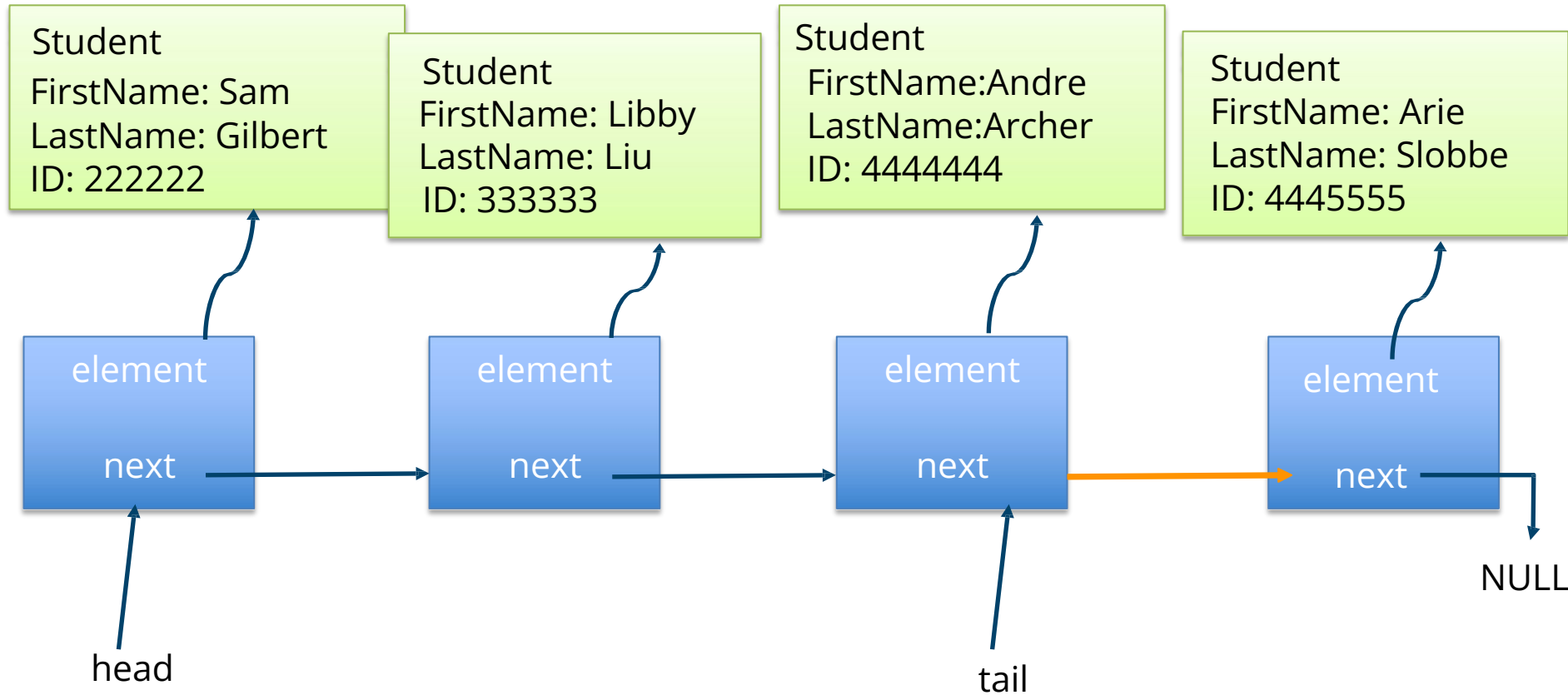
- Covers LG 1 Arrays, LG2 Time Complexity, LG3 Stacks,
- Paper Exams
- Open notes, open textbook, open Moodle resources, open prior programs from this class

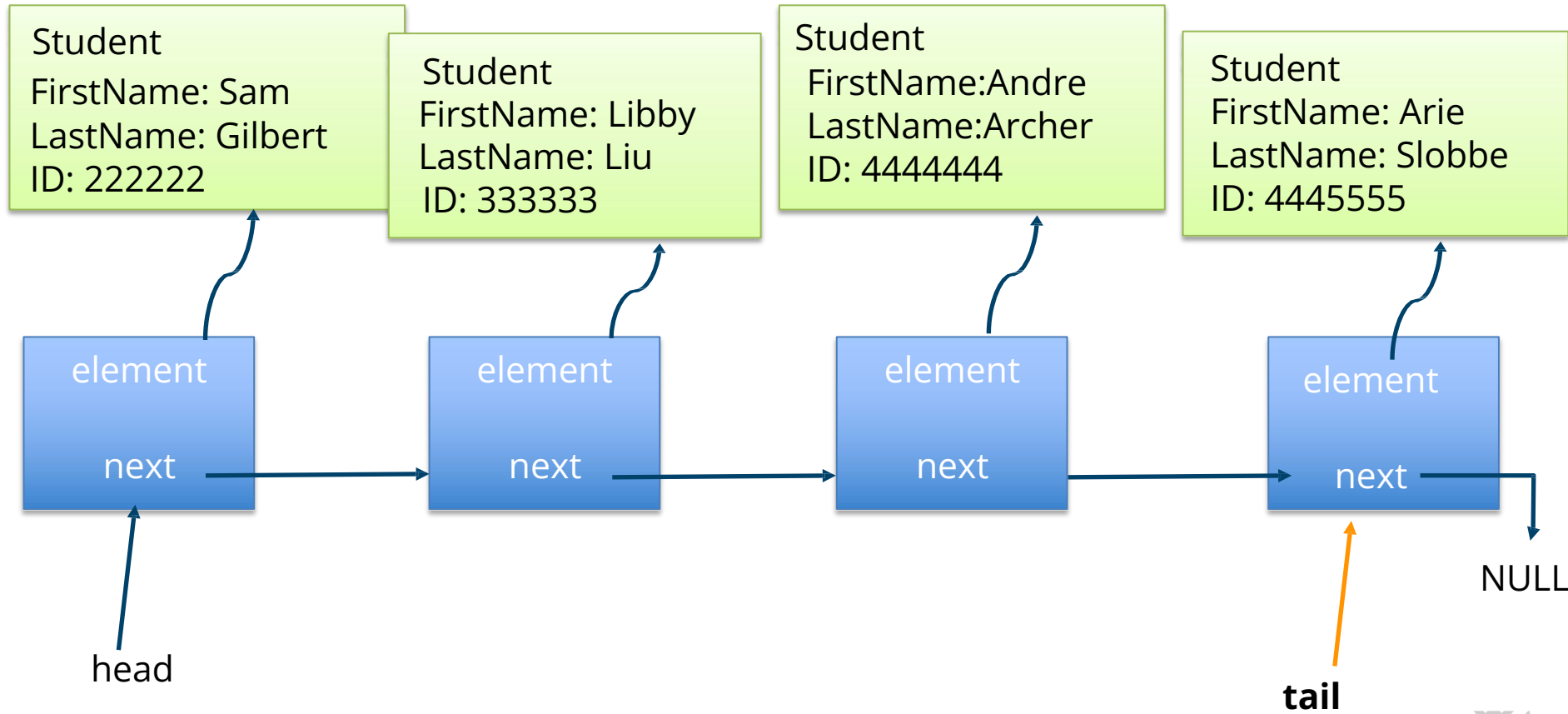


# Linked-Node Queues

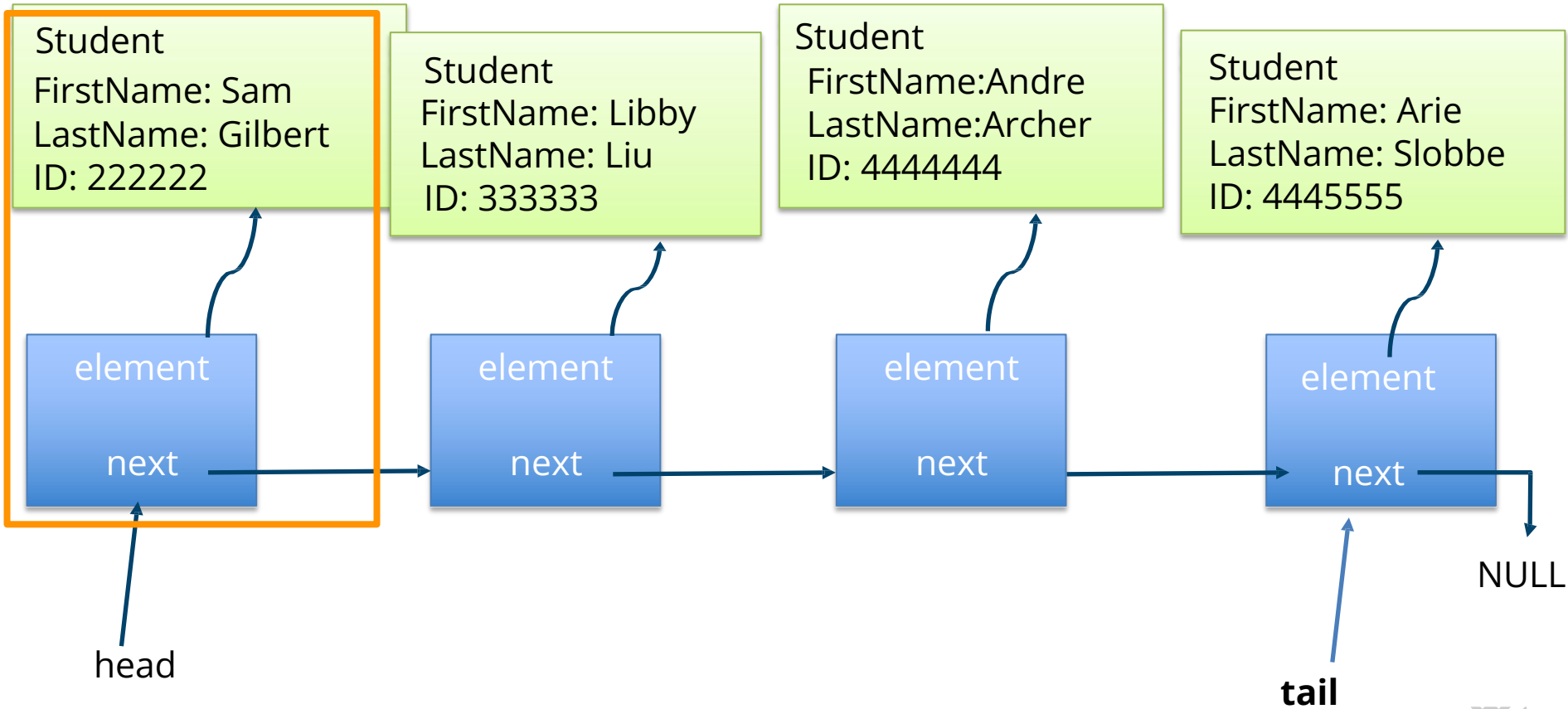


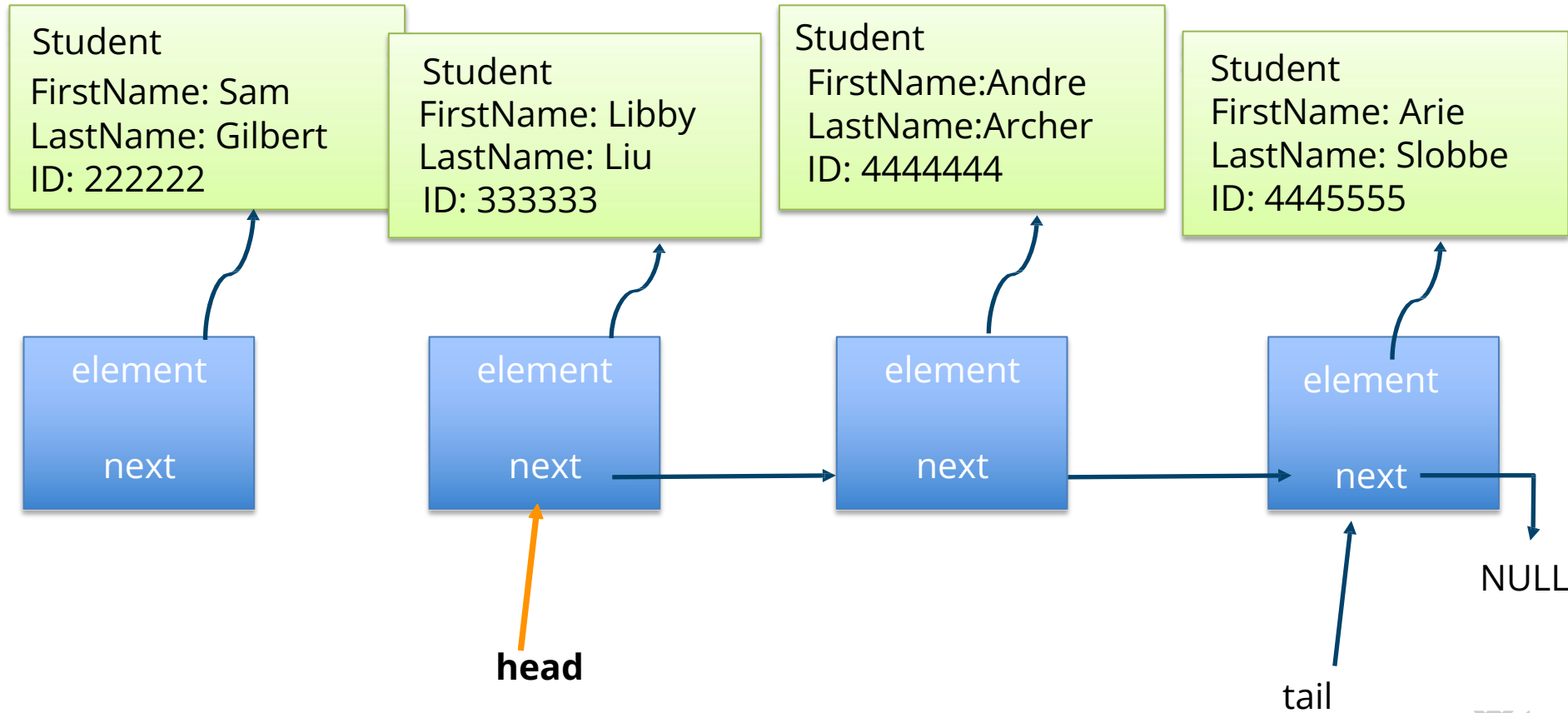






## Return the element









# How do we iterate through a queue?



# How do we iterate through a queue?

1. Create another queue (modify the queue)
2. Use next method with linked implementation  
(LinearNode's getNext() method)
3. For each loop and iterator with Java's Implementation

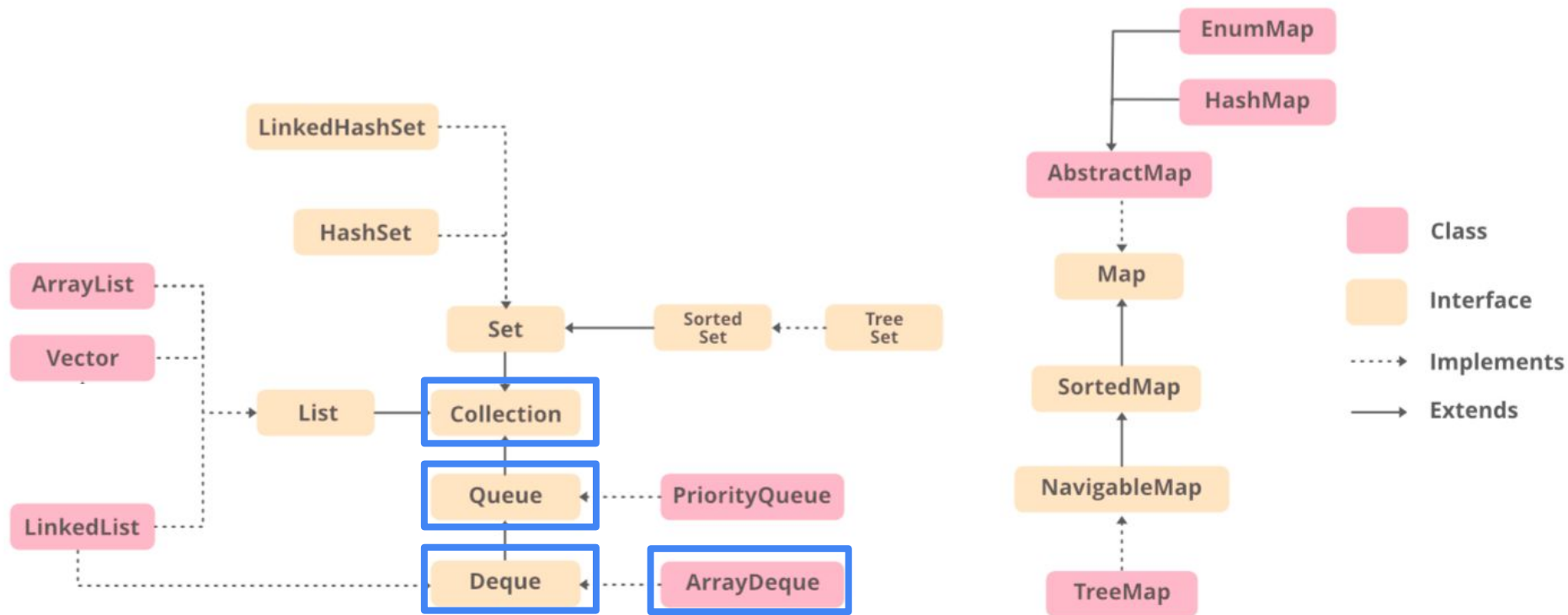


# Iterating with Java Collections

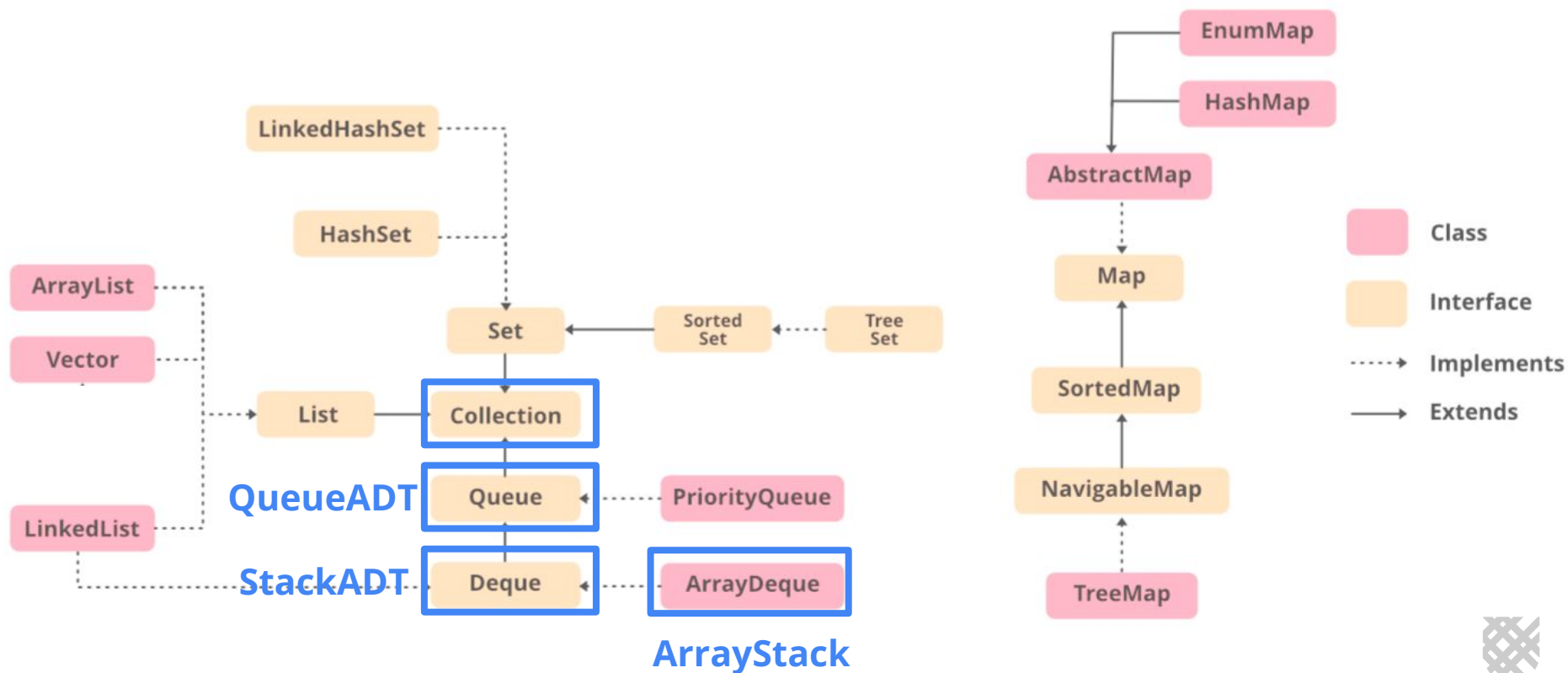
```
Queue<Integer> queue = new LinkedList<Integer>();  
Iterator<Integer> itr = queue.iterator();  
while (itr.hasNext()) {  
    // use itr.next() to access the element  
}  
  
for (Integer item: queue) {  
    // item variable associates with the element  
}
```



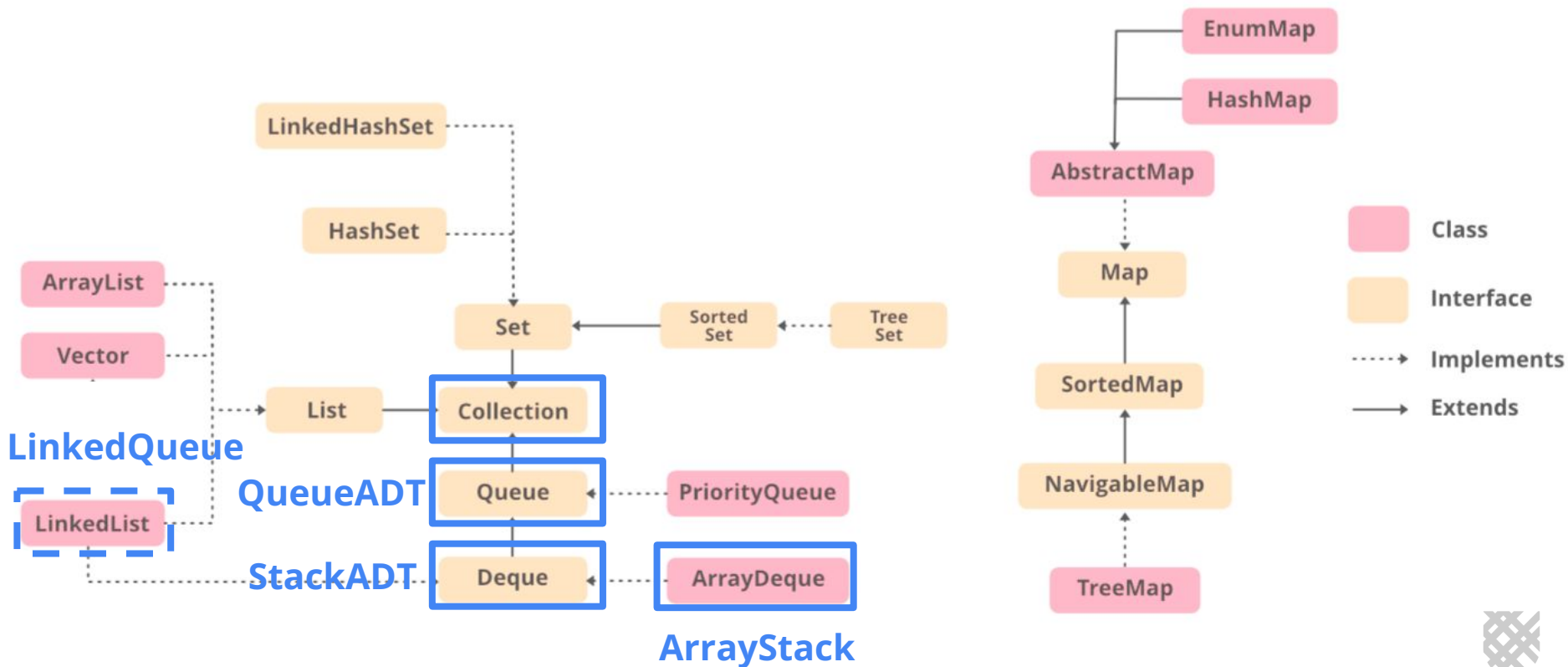
# Java Collections Framework



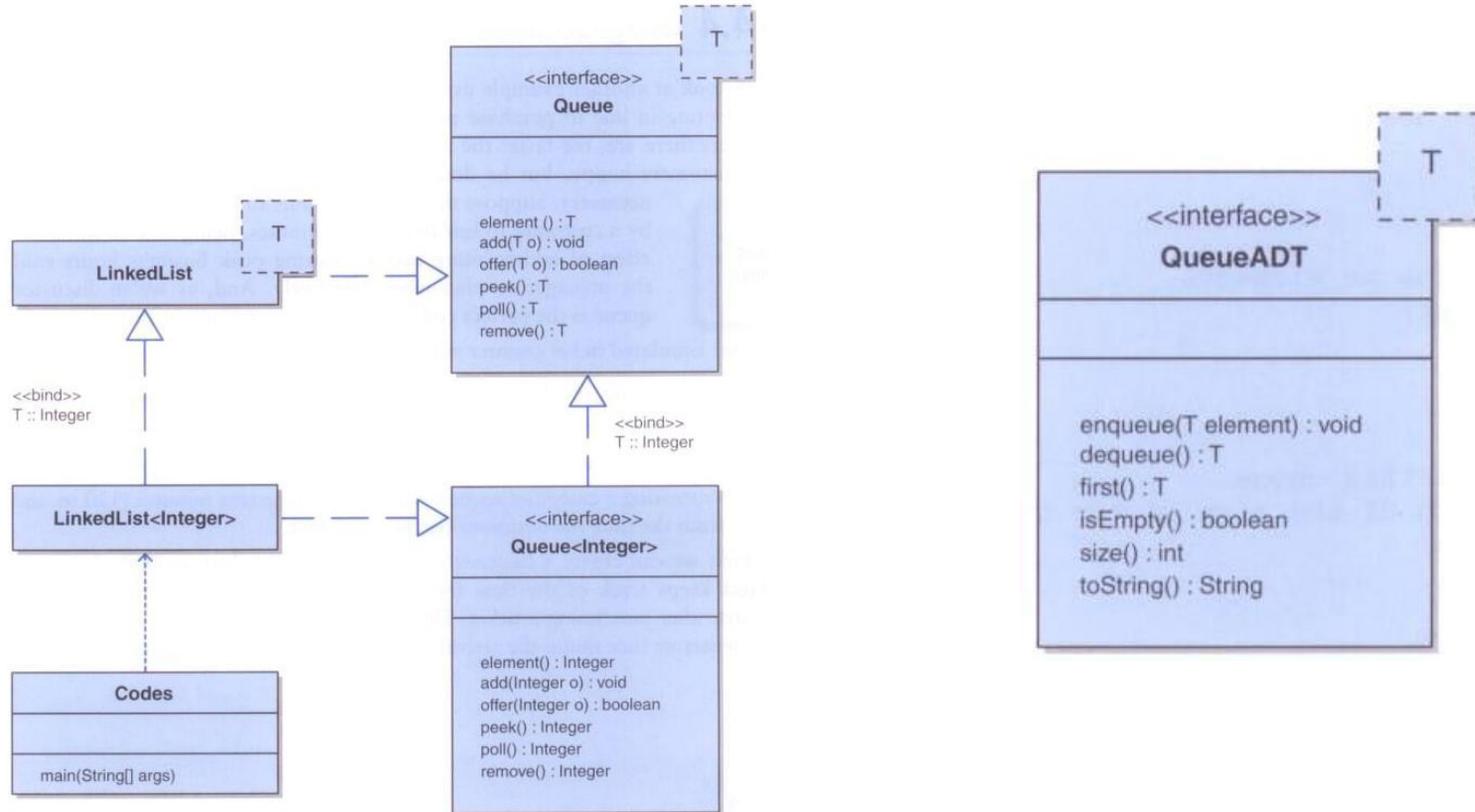
# Foundations Textbook



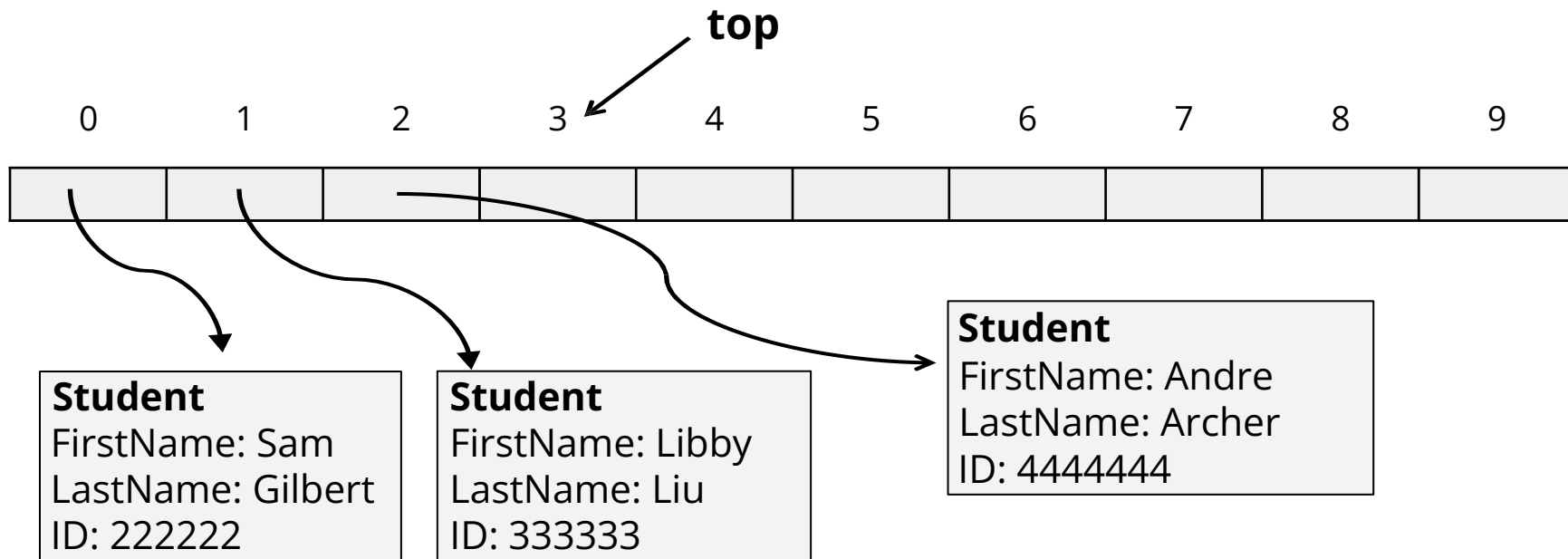
# Java Collections vs. Foundations Textbook



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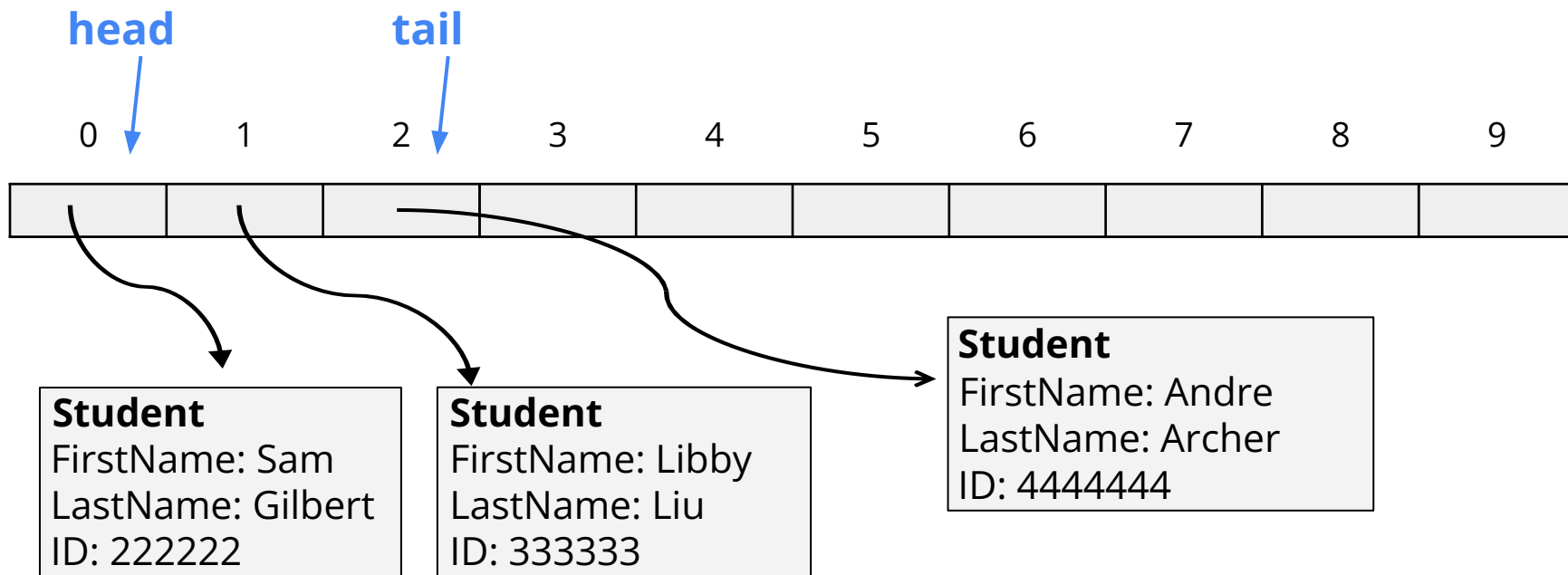


# Implementing Queue with an Array

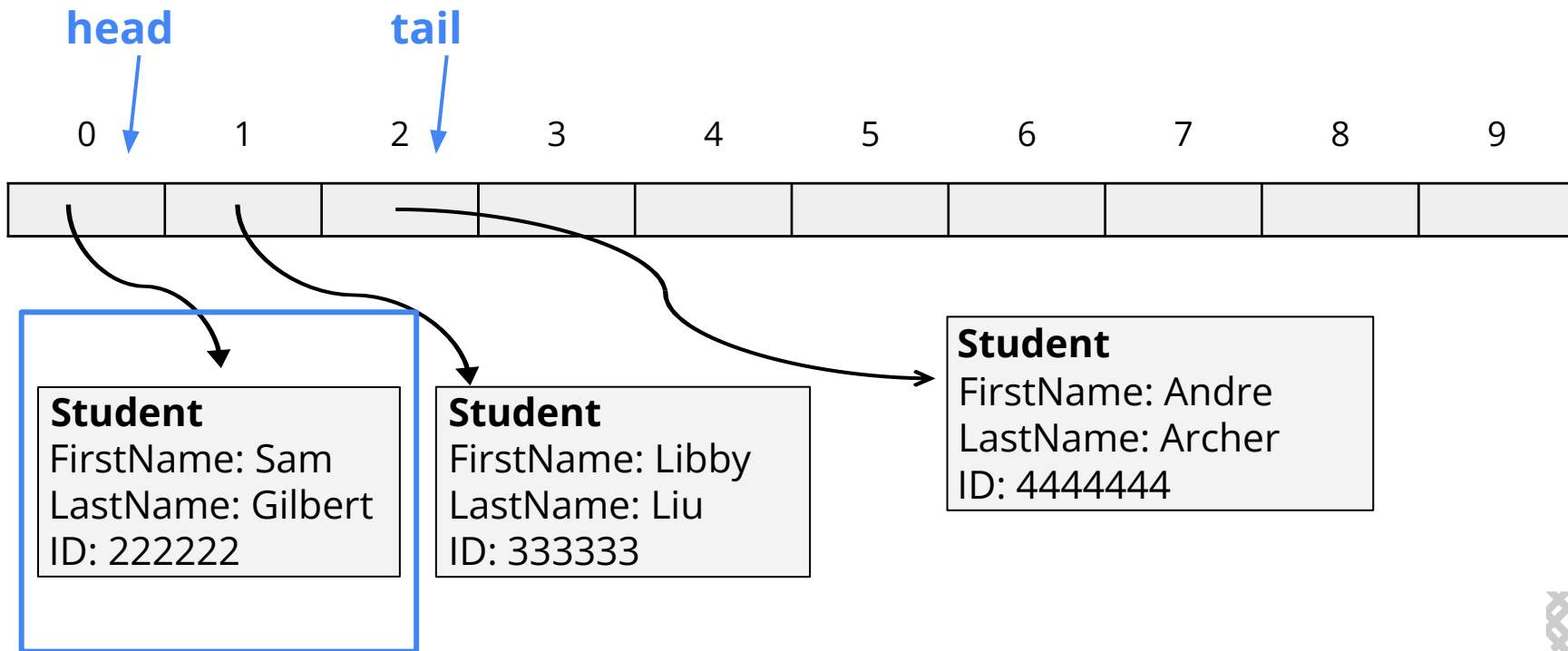




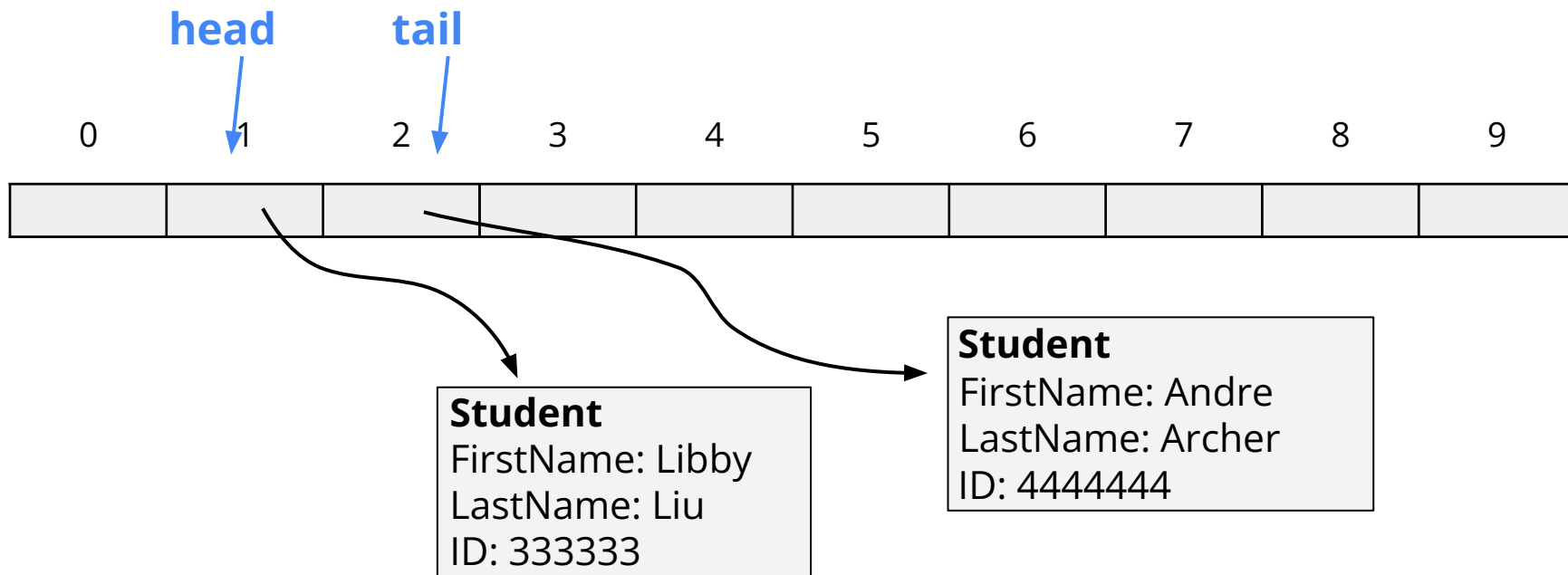
# Implementing Queue with an Array



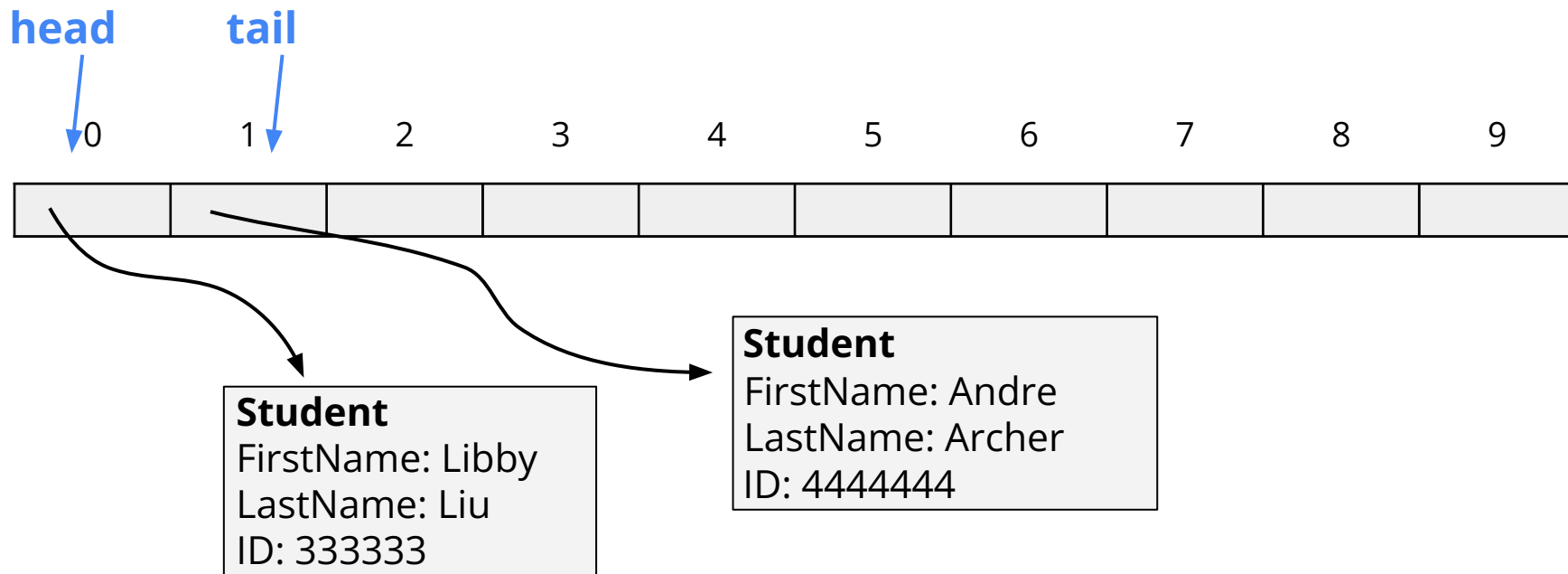
# What are some potential problems?



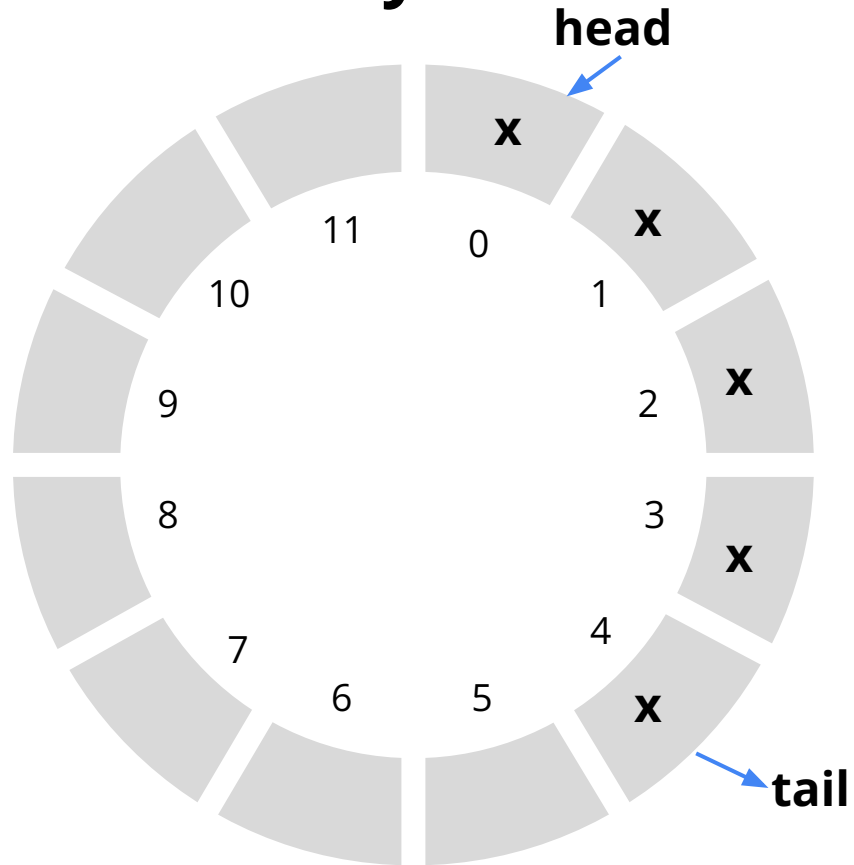
# What are some potential problems?



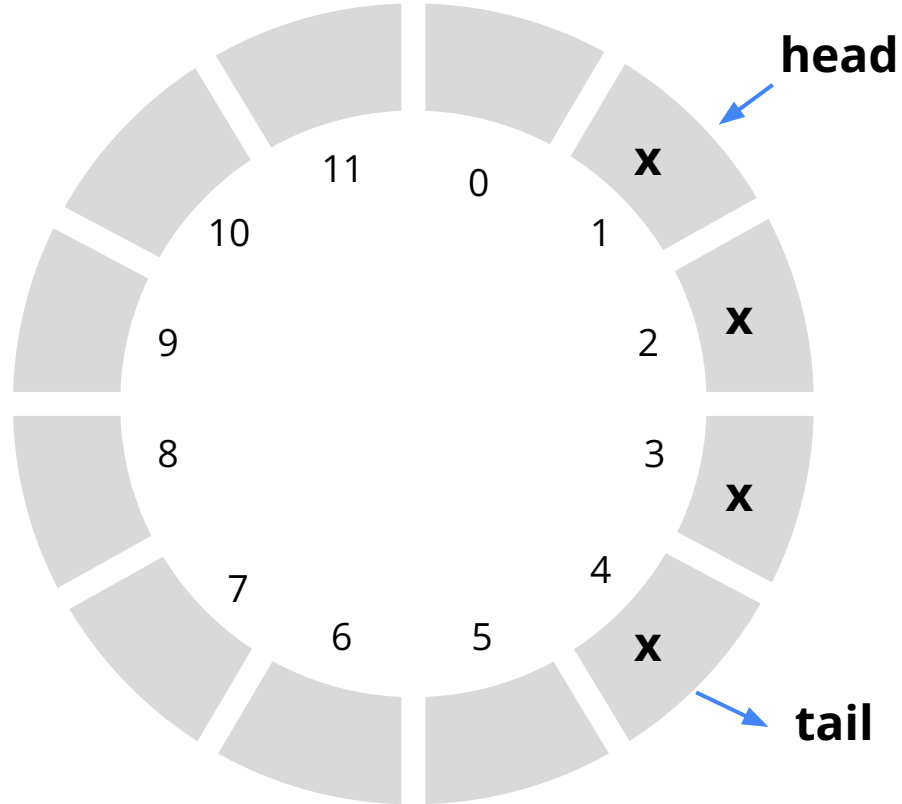
# What are some potential problems?



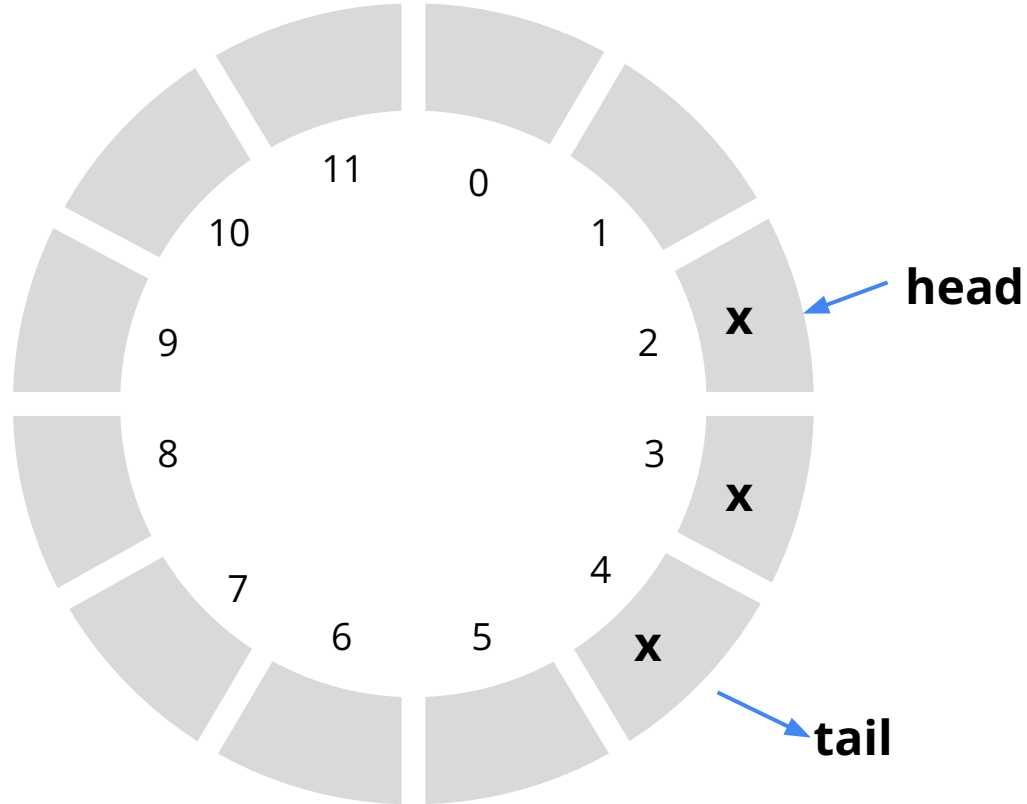
# Using a Circular Array



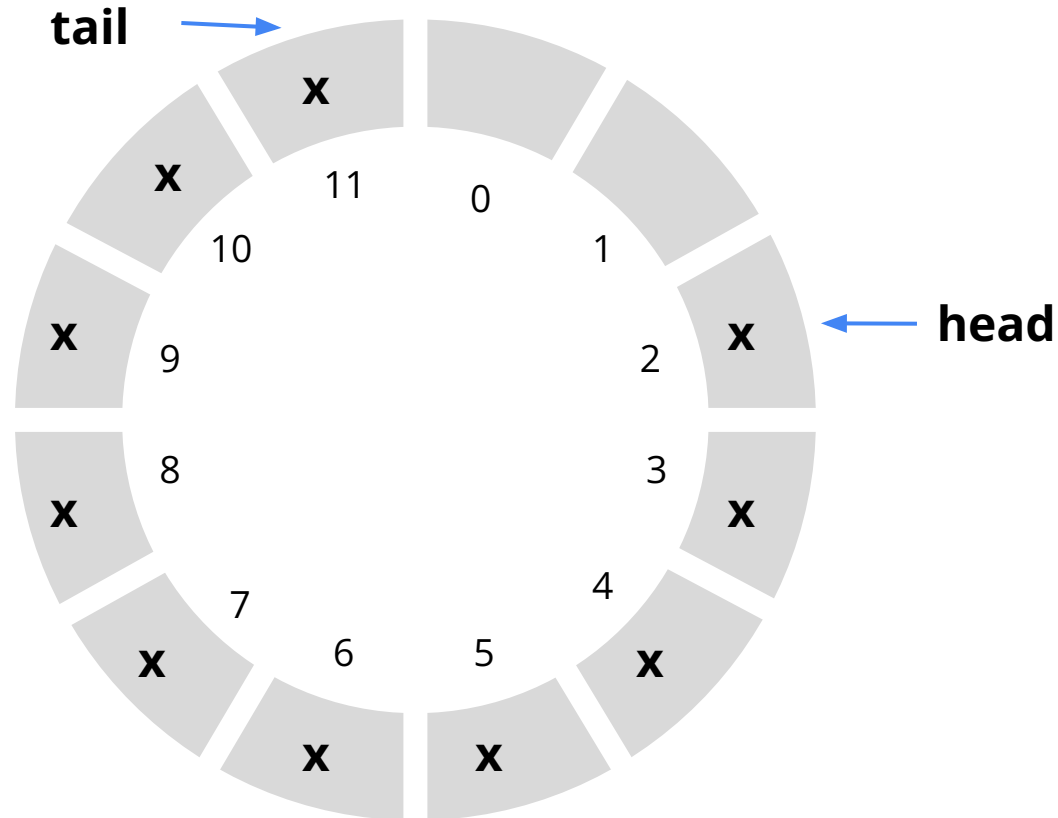
# Removing Element



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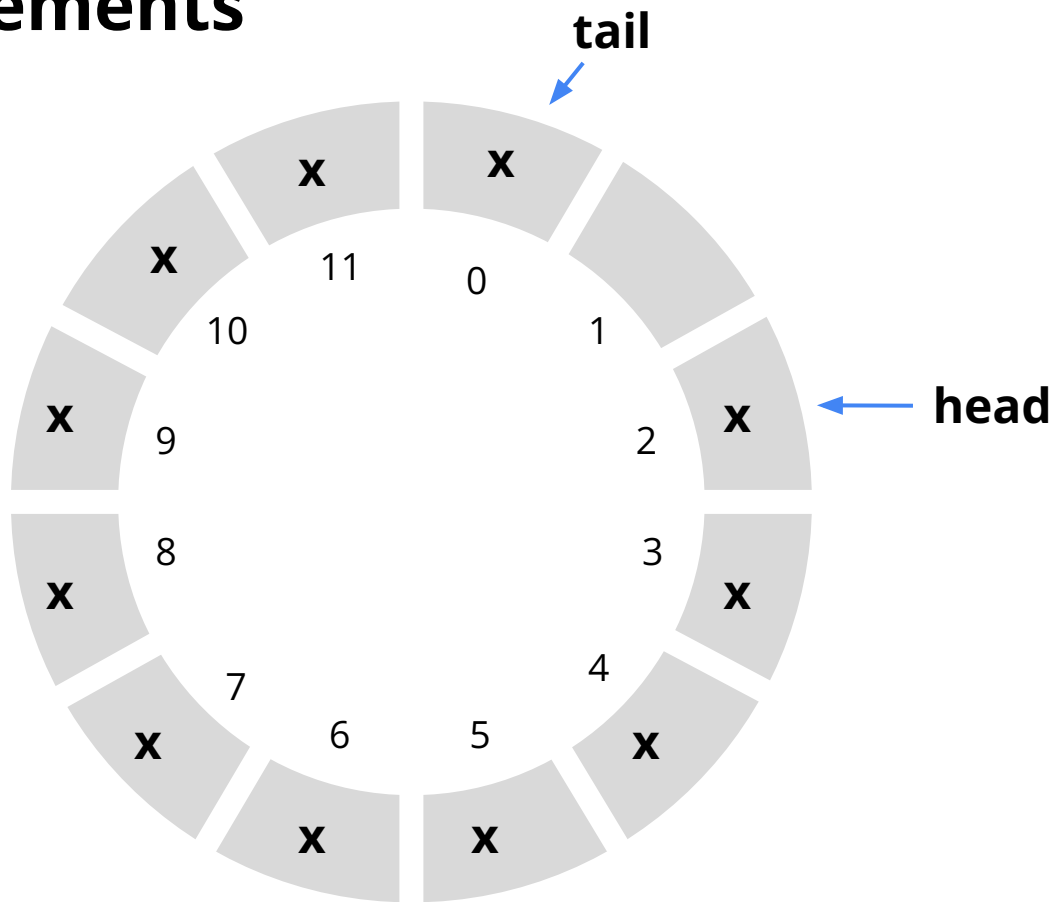


# Adding Elements

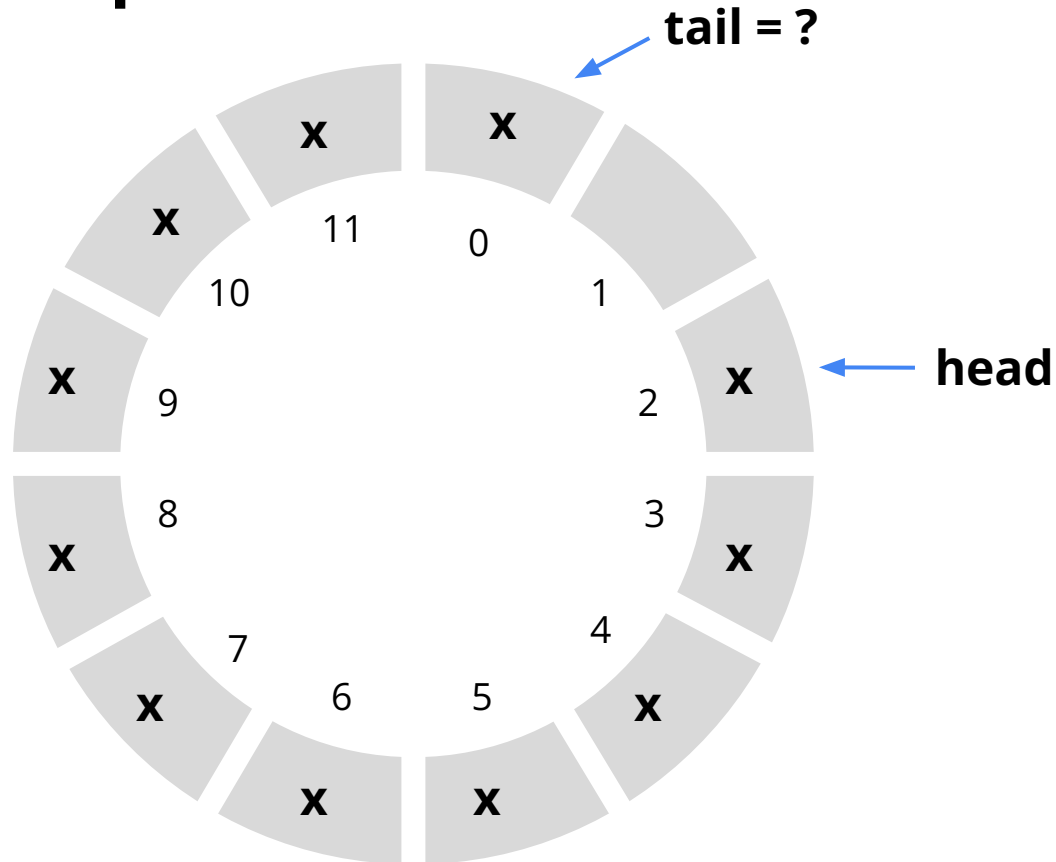




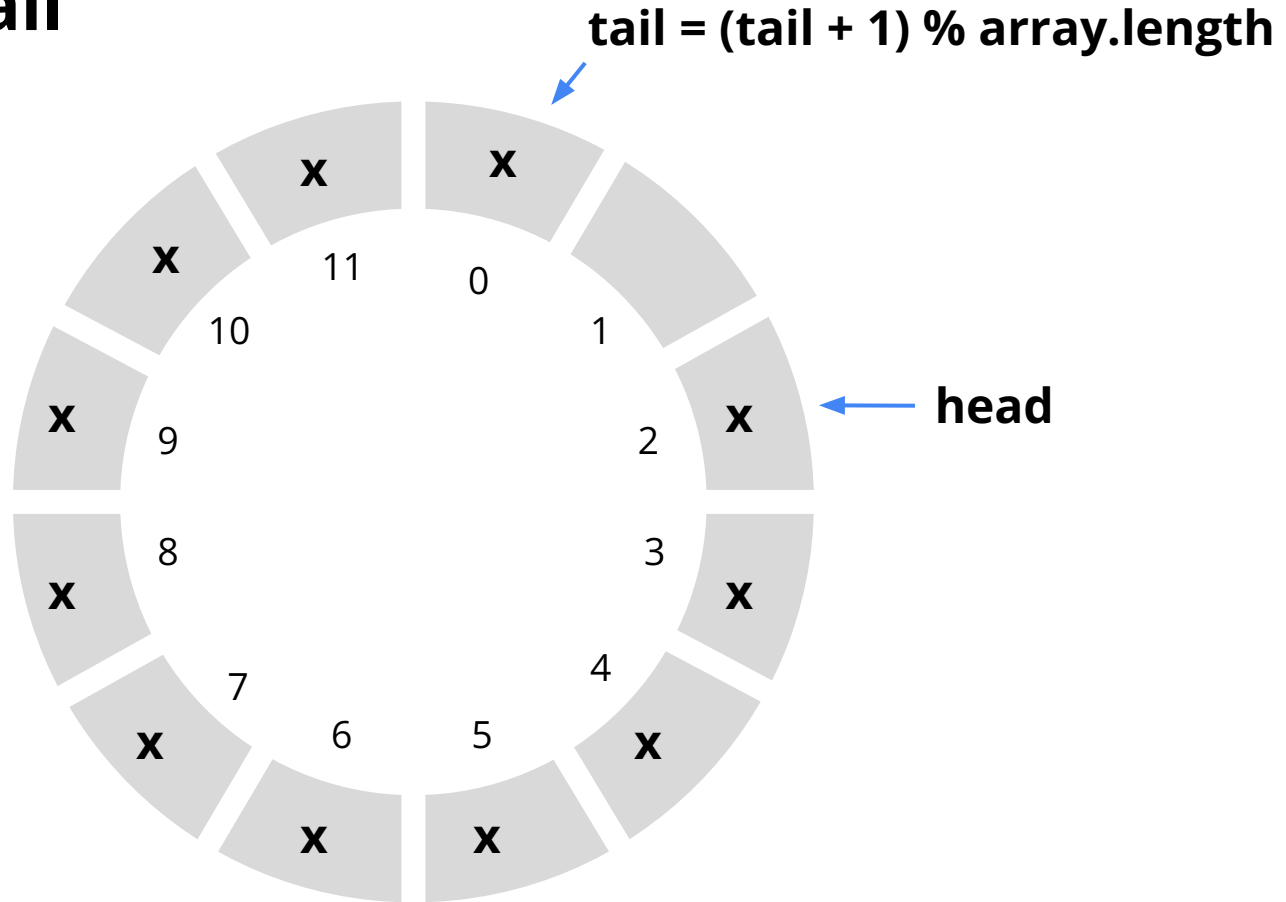
# Adding Elements



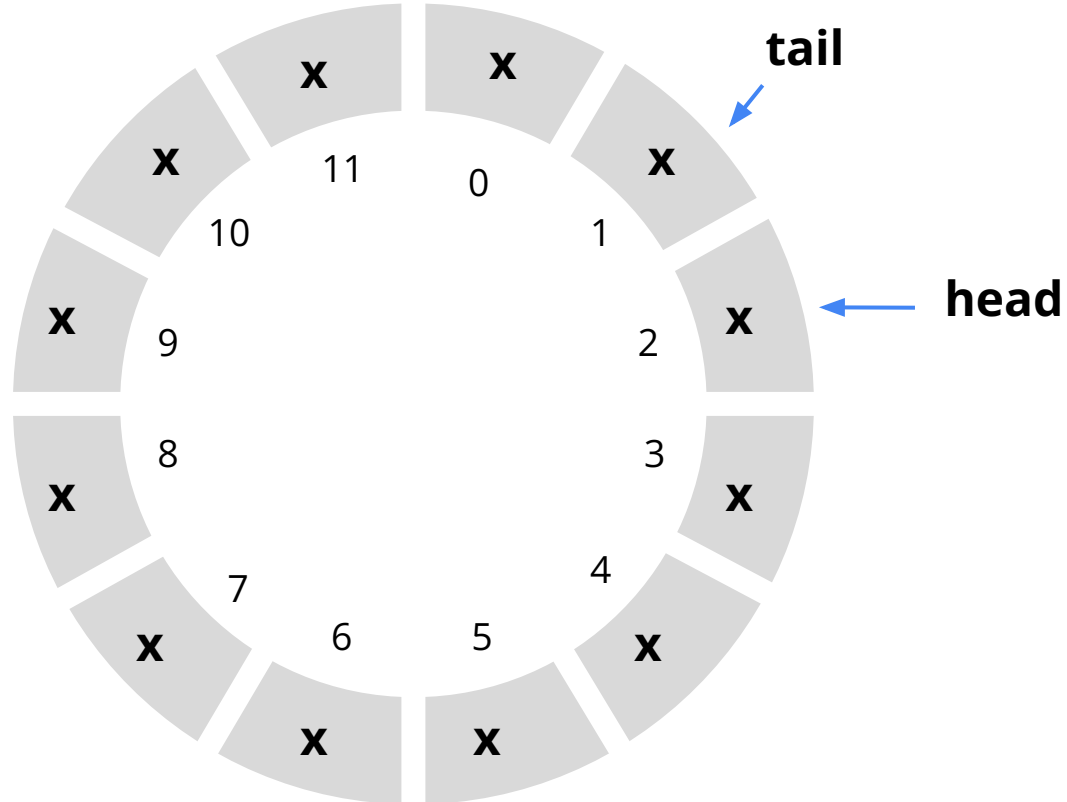
# How do we update the tail?



# Update Tail



# Expanding Array





# **In-class Activity**

