Lecture 15: Queues and Practice Problems

CS 62

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Implementing Queue using an array

- Assume we know max capacity required
- Keep track of `head` and `count` and have the data wrap around at the end of the array
  - Always add at the `tail=(head + count) % data.length`
  - Always remove from the `head`
- Use modular arithmetic to calculate indices
  - e.g., `headIndex=(headIndex+1)%data.length` when `remove()`
- http://www.cs.pomona.edu/classes/cs062/structure5/QueueArray.java

Practice Time

4 classic interview problems on linked lists, queues, and stacks

Work in groups

Pick 2 problems (one from linked lists and one from queues & stacks)

Write unit tests

Work on both for the next ~30'
Continue with a new one if done before the allotted time

Assume you can use data structures offered in `structure5` package

Write a Java program that:

1) Removes duplicate nodes in an unsorted singly linked list
   - Hint: Remember that you can use two pointers to traverse a list

2) Returns the kth to last element of a singly linked list
   - Hint: Think recursion

3) Represents a queue using two stacks. Should support `enqueue, dequeue, peek, size`

4) Reverses a queue using a stack