

# Stacks and Queues

## Unit 6

### Circular Queue Demo

CS 2308  
Spring 2024

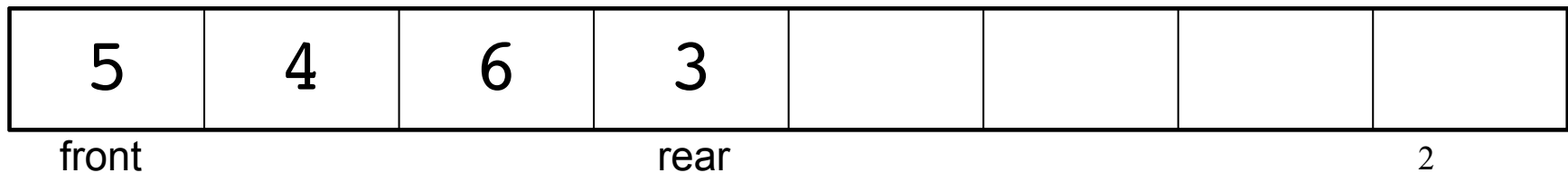
Jill Seaman

# Circular Queue example

**q.enqueue(5)**  
**q.enqueue(4)**  
**q.enqueue(6)**  
**q.enqueue(3)**  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

10 enqueues, but the queue is size 8  
No more than 6 elements in the queue at one time

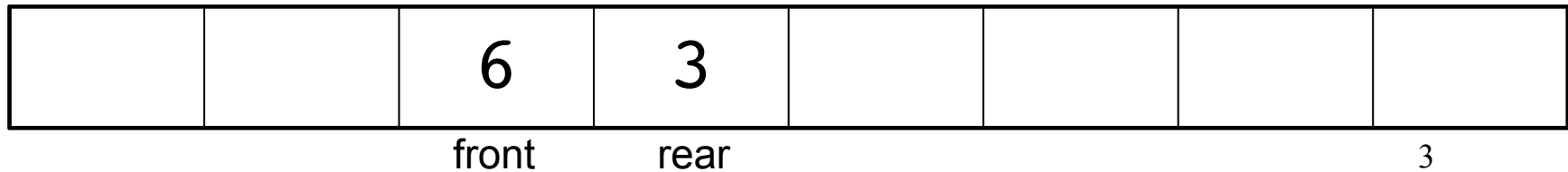
front = 0  
rear = 3



# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

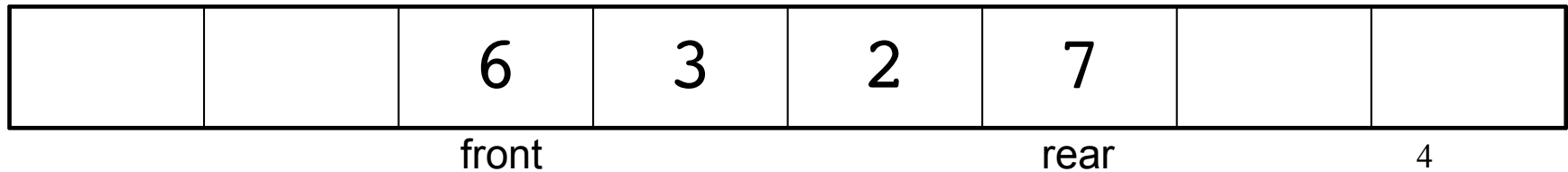
front = 2  
rear = 3



# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

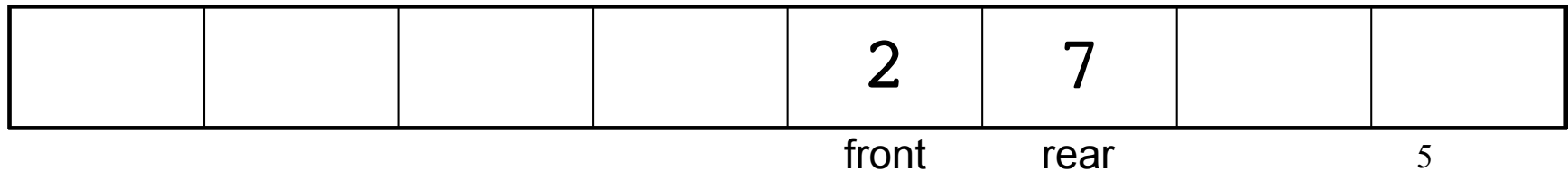
front = 2  
rear = 5



# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

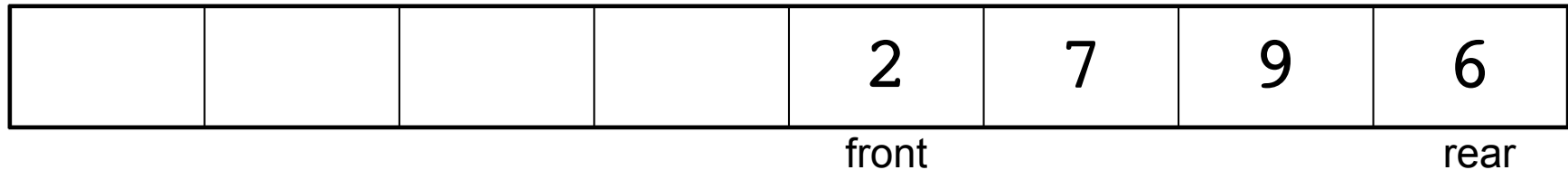
front = 4  
rear = 5



# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

front = 4  
rear = 7



# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

front = 4  
rear = 0  
(because  $(7+1)\%8 = 0$ )

3				2	7	9	6
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rear

front

# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

front = 4  
rear = 1

3	4			2	7	9	6
---	---	--	--	---	---	---	---

rear

front



# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

q.enqueue(5)  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()

front = 4  
rear = 1

3	4			2	7	9	6
---	---	--	--	---	---	---	---

rear

front

# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

q.enqueue(5)  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()

front = 4  
rear = 2

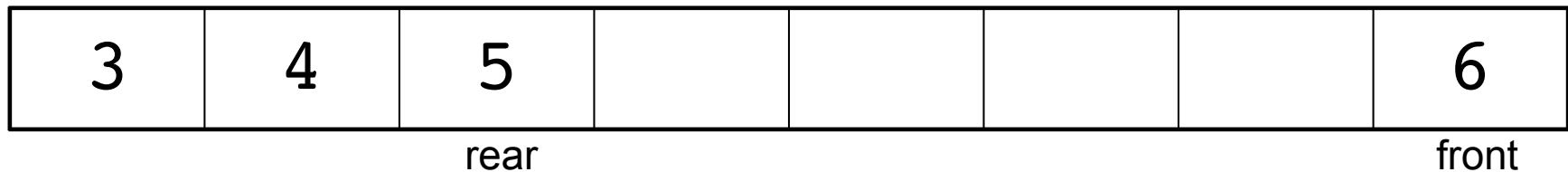


# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

q.enqueue(5)  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()

front = 7  
rear = 2

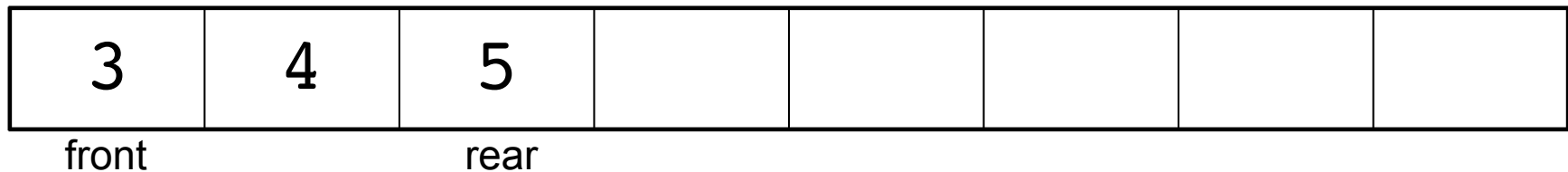


# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

q.enqueue(5)  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()

front = 0  
(because  $(7+1)\%8 = 0$ )  
rear = 2



# Circular Queue example

q.enqueue(5)  
q.enqueue(4)  
q.enqueue(6)  
q.enqueue(3)  
q.dequeue()  
q.dequeue()  
q.enqueue(2)  
q.enqueue(7)  
q.dequeue()  
q.dequeue()  
q.enqueue(9)  
q.enqueue(6)  
q.enqueue(3)  
q.enqueue(4)

q.enqueue(5)  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()  
q.dequeue()

front = 1  
rear = 2

