EE 368

Weeks 2 (Notes)

FIFO (First In First Out) Queues (ordered-list)

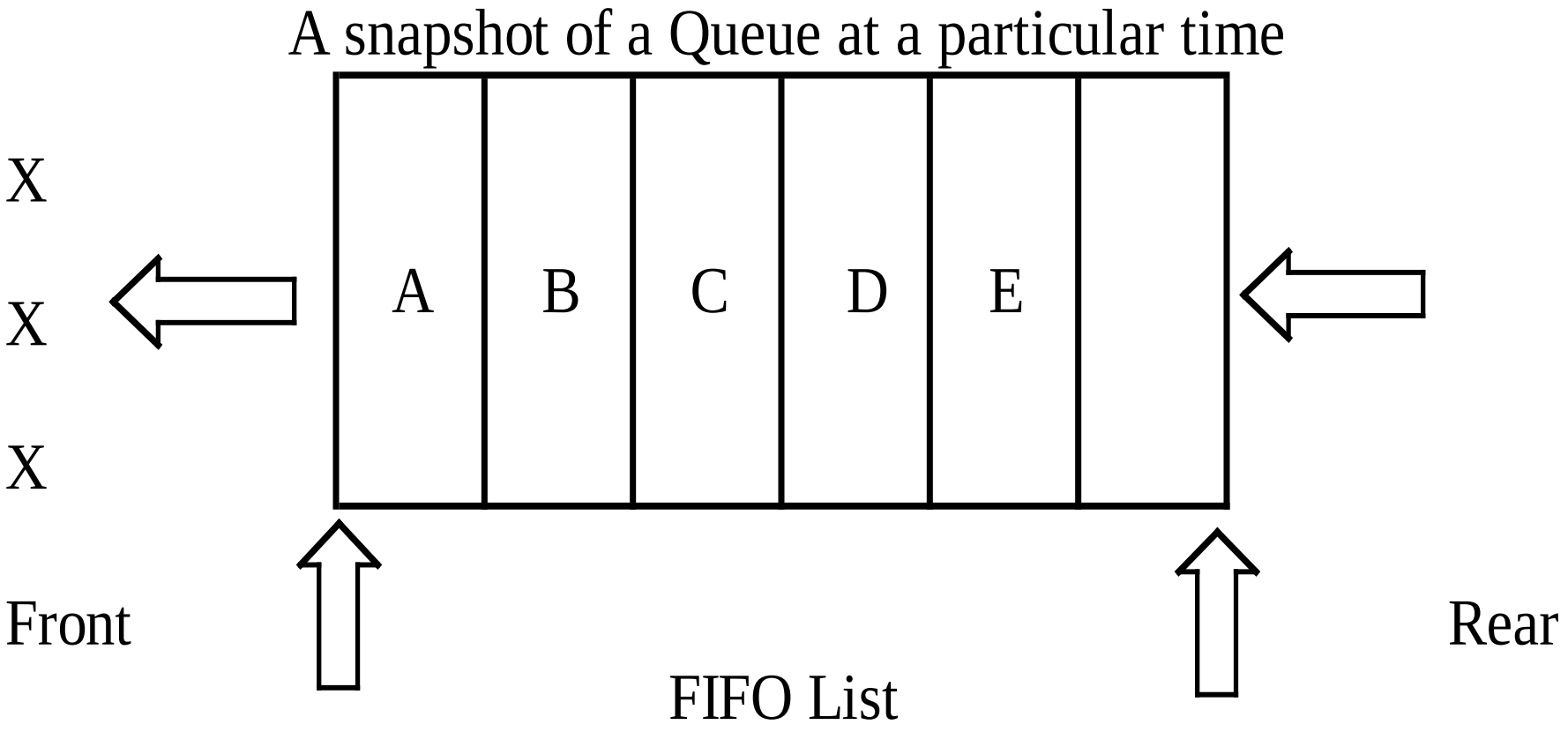
Scheduling Batch Jobs on a Single Computer

Queue for Bank Tellers

Queues for Grocery Stores

Road Toll Booths

FIFO Queues
(ordered-list)



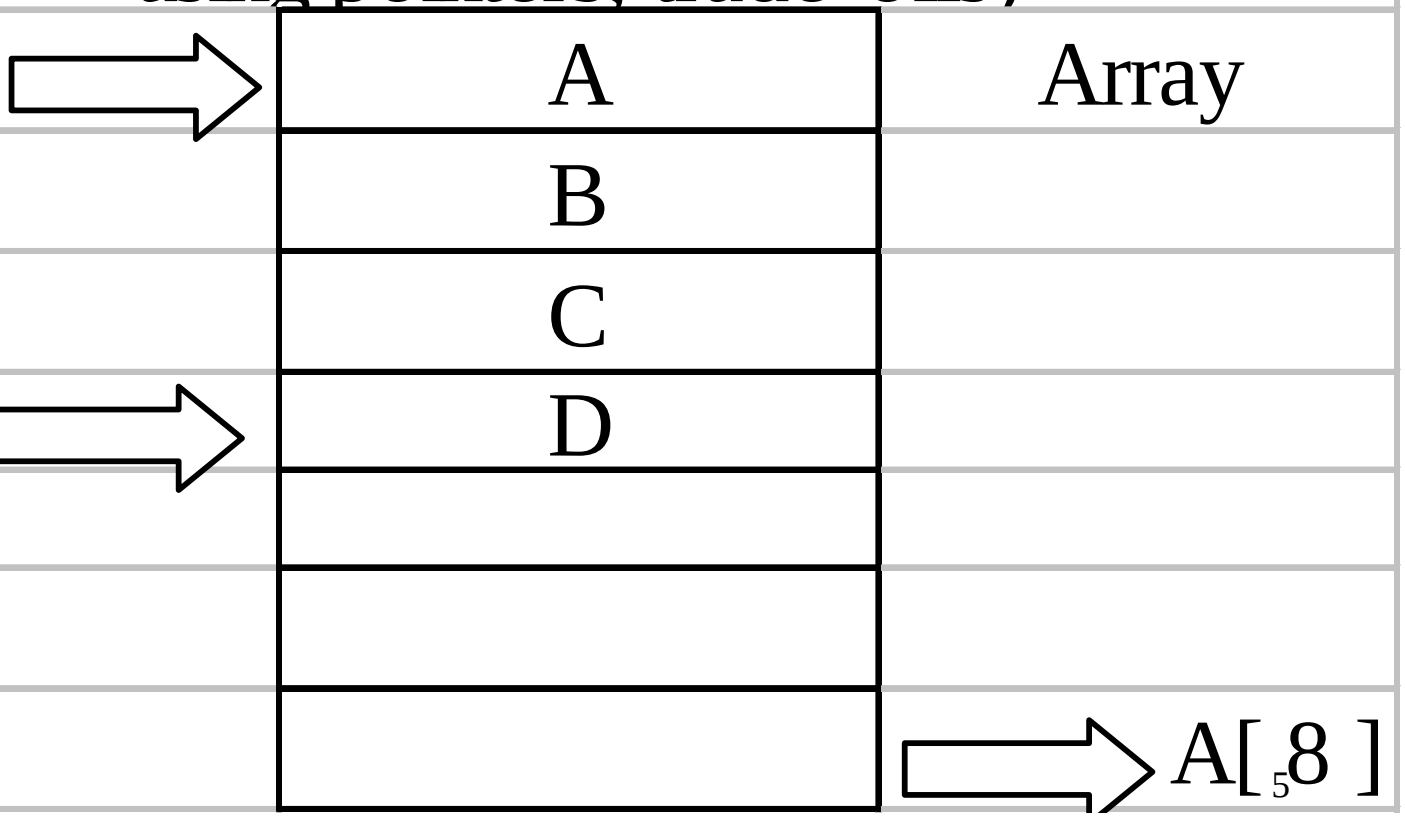
Operations of FIFO Queues

- Add Queue (adding elements to the rear)
- Delete Queue (de-queue from the front)
- Empty
- Full
- Size

Implementation of FIFO Queues

Implementation of FIFO Queues

(implementation using Arrays and Linked-List using pointers, trade-offs)



Problem with Array-Based Implementation

1) Index overflow

2) Movement of array elements is costly

One option:

Use Circular Array.

Priority Queue (ordered collection)

- Need
- Implementation using Arrays and Linked-List using pointers, trade-offs for various operations.

Introduction to Queuing Theory

Random Variable

Discrete

Continuous

Density Function (PDF)

Discrete:

Bernoulli

Binomail

Geometric

Poisson

Introduction to Queuing Theory (cont.)

Exponential
Normal — Continuous
Uniform

Parameters of Interest

Mean or Expected Value
Variance
Standard Deviation

Queuing Theory

Use: To model and evaluate various physical systems where resources are shared and waiting takes place.

Notation for Queuing System: A/B/C/D (Kendal's Notation)

<u>M, D, G</u>	A: Inter-arrival time PDF
	B: Service Time PDF
	C: Number of Servers
	D: Buffer Size

Example: M/M/1, M/G/1, M/M/2/40 $D = \infty$

Queuing Theory (cont.)

A: M (Exponential),
—> Arrival Process is Poisson.

B: M (Exponential),
Service Time Distribution is Exponential.