



Data Structure

Lab Session #4: Lists, Stacks, and Queues

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Goals

- Learn how to manipulate a queue
 - Fill in the following methods in MyQueue.java
 - enqueue, dequeue, pop, clear.
- Print the sample output corresponding to the sample input
 - Please carefully observe the I/O specification.



Notice

- Please raise your hand and ask to T.A. if you have a problem to implement it.
- You need to stay for at least an hour.



Build a project

- Download the project for this lab from eTL.
- Extract the project, and open it in IntelliJ
 - See the slide of 1st lab session to check how to open the project in Eclipse.

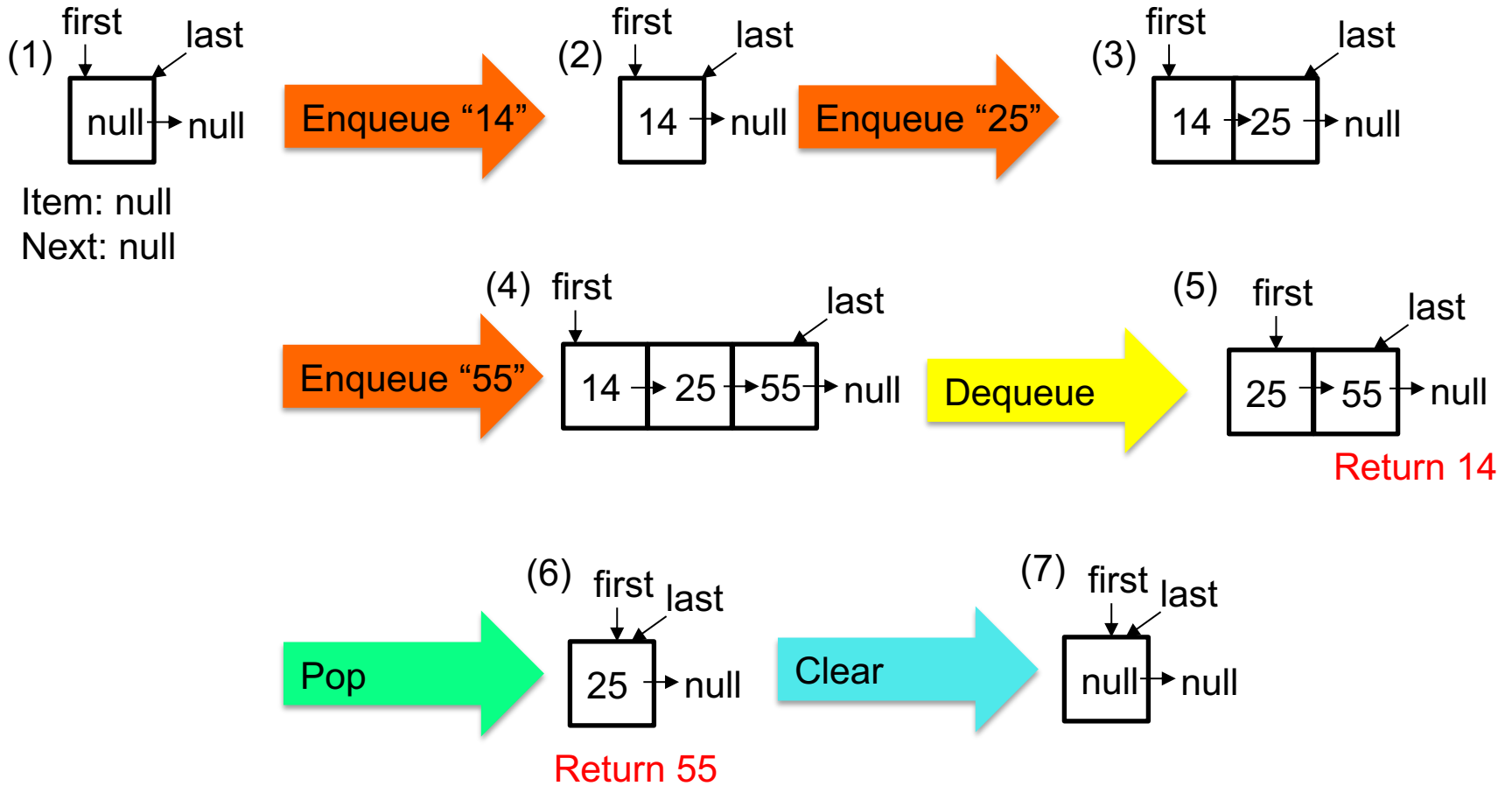


Queue

- FIFO: First in, First Out
- Restricted form of list: Insert at one end, remove from the other.



Queue





I/O Specification

■ enqueue

Input format	Output format
ENQUEUE (item)	ENQUEUE (item) (curr queue)
Description	
<ul style="list-style-type: none">- Enqueue an (item)- (item) is an element to be inserted.	
Example Input	Example Output
ENQUEUE Chris	ENQUEUE Chris (Ada Bob Chris)



I/O Specification

■ dequeue

Input format	Output format
DEQUEUE	DEQUEUE (item) (curr queue)
Description	
<ul style="list-style-type: none">- Dequeue an item.- (item) is the first element that is removed from the queue.- Return “null” when the queue is empty.	
Example Input	Example Output
DEQUEUE	DEQUEUE Ada (Bob Chris)



I/O Specification

■ pop

Input format	Output format
POP	POP (item) (curr queue)
Description	
<ul style="list-style-type: none">- Pop an item.- (item) is the last element that is removed from the queue.- Return “null” when the queue is empty.	
Example Input	Example Output
POP	POP Ellen (Chris Dan)



I/O Specification

■ size

Input format	Output format
SIZE	SIZE (size) (curr queue)
Description	
<ul style="list-style-type: none">- Print size of the queue.	
Example Input	Example Output
SIZE	SIZE 3 (Ada Bob Chris)



I/O Specification

■ clear

Input format	Output format
CLEAR	CLEAR - (curr queue)
Description	
- Clear the queue. (Remove all items in the queue.)	
Example Input	Example Output
CLEAR	CLEAR - ()



I/O Specification

■ print

Input format	Output format
PRINT	PRINT - (curr queue)
Description	
- Print items in the queue.	
Example Input	Example Output
PRINT	PRINT - (Ada Bob Chris)



Sample Input

```
ENQUEUE Ada
ENQUEUE Bob
SIZE
DEQUEUE
DEQUEUE
SIZE
ENQUEUE Chris
ENQUEUE Dan
ENQUEUE Ellen
SIZE
POP
DEQUEUE
POP
SIZE
ENQUEUE Frank
ENQUEUE Gill
SIZE
CLEAR
PRINT
```



Sample Output

Operate	Value	Queue
ENQUEUE	Ada	(Ada)
ENQUEUE	Bob	(Ada Bob)
SIZE	2	(Ada Bob)
DEQUEUE	Ada	(Bob)
DEQUEUE	Bob	()
SIZE	0	()
ENQUEUE	Chris	(Chris)
ENQUEUE	Dan	(Chris Dan)
ENQUEUE	Ellen	(Chris Dan Ellen)
SIZE	3	(Chris Dan Ellen)
POP	Ellen	(Chris Dan)
DEQUEUE	Chris	(Dan)
POP	Dan	()
SIZE	0	()
ENQUEUE	Frank	(Frank)
ENQUEUE	Gill	(Frank Gill)
SIZE	2	(Frank Gill)
CLEAR	-	()
PRINT	-	()



Questions?