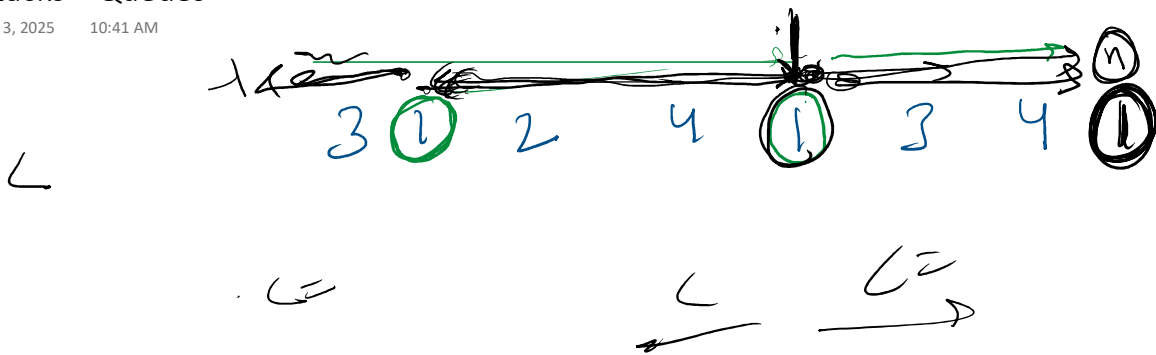


### 3.13 - Stacks + Queues

Sunday, August 3, 2025 10:41 AM



# 1 3 1 2 1 4

$(1)$   $(3)$   $(1)$   $(2)$   $(1)$   $(4)$   
 $(1, 3)$   $(3, 1)$   $(1, 2)$   $(2, 1)$   $(1, 4)$   $(4, 1)$   
 $(1, 3, 1)$   $(3, 1, 2)$   $(1, 2, 1)$   $(2, 1, 4)$   $(1, 4, 1)$   
 $(1, 3, 1, 2)$   $(3, 1, 2, 1)$   $(1, 2, 1, 4)$   $(2, 1, 4, 1)$   
 $(1, 3, 1, 2, 1)$   $(3, 1, 2, 1, 4)$   $(1, 2, 1, 4, 1)$   $(2, 1, 4, 1, 1)$   
 $(1, 3, 1, 2, 1, 4)$

	0	1	2	3	4	5
	1	3	1	2	1	4
e	-1	0	0	2	2	4
r	6	2	6	4	6	6

$1 \times 6$   $1 \times 6$   $2 \times 4$   $1 \times 1$   $2 \times 2$   $1 \times 1$   
 $6$   $6$   $8$   $1$   $4$   $4$

$(1)$   $(1)$   $(1)$   $(1)$

(1) (1) ~~3~~

(43)

(1,3,1)

(1,3,1,2)

(1,3,1,2,1)

(1,3,1,2,1,4)

(1)

(311)

(1)

(1,2)

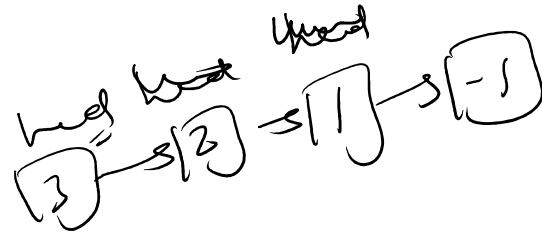
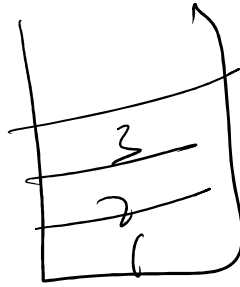
(1,2,1)

(1,2,1,4)

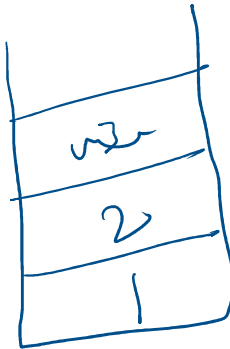
# Queue

⇒ Stack Using LIFO

1, 2, 3

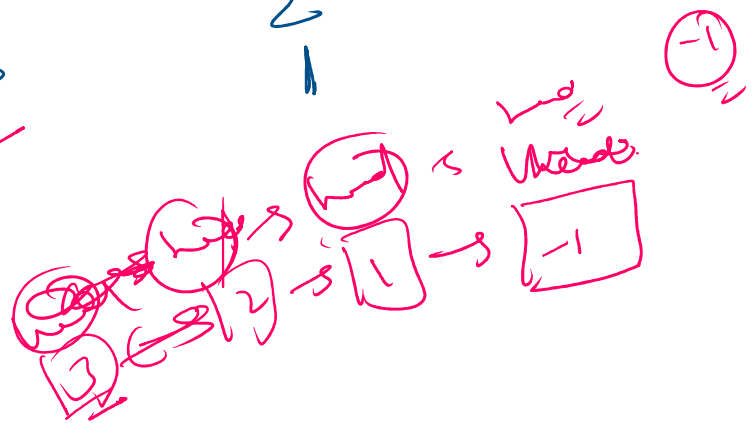


→

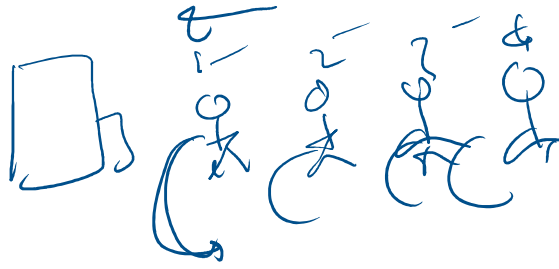


push 1 ✓  
push 2  
push 3  
pop ✓  
pop  
pop

3  
2  
1

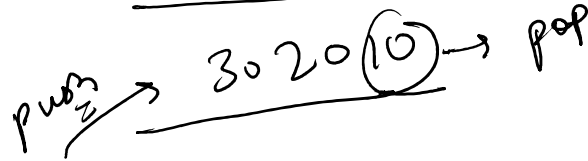


# # Queue



FIFO

↳ first in first out



10  
20  
30

→ push (5)

push (8)

push (10)

push (15)

pop()

peek()

pop()  
pop()

peek()

push (20)

peek()



→ enqueue } insert / push

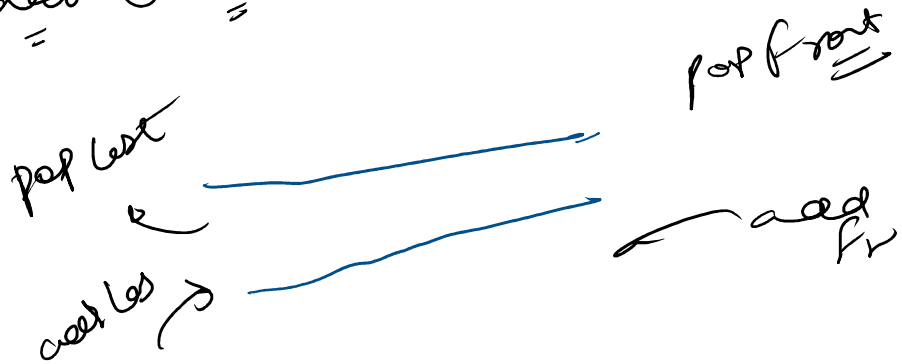
→ dequeue } deletion / pop

→ offer  
→ poll()

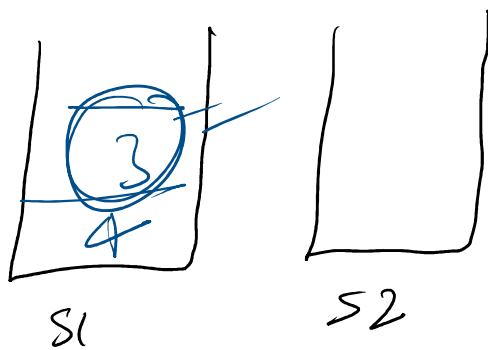
⇒ Doubly Ended Queue

pop front

7) Doubly Ended Queue -

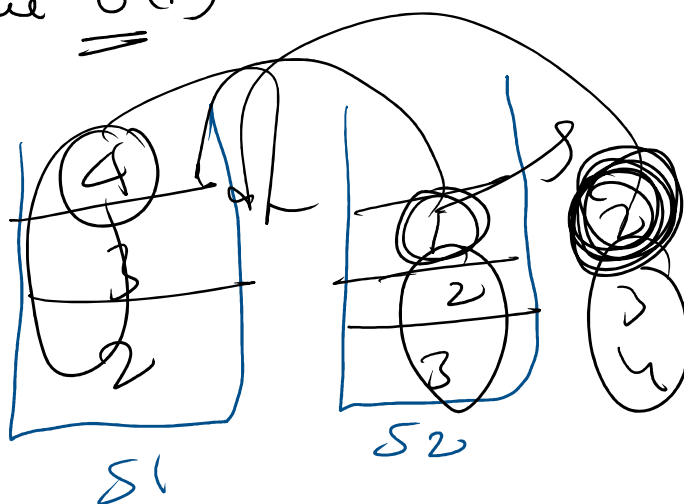


# Queue using 2 Stacks (Deque  $O(1)$ )



1 2  
1 3  
2  
1 4  
2

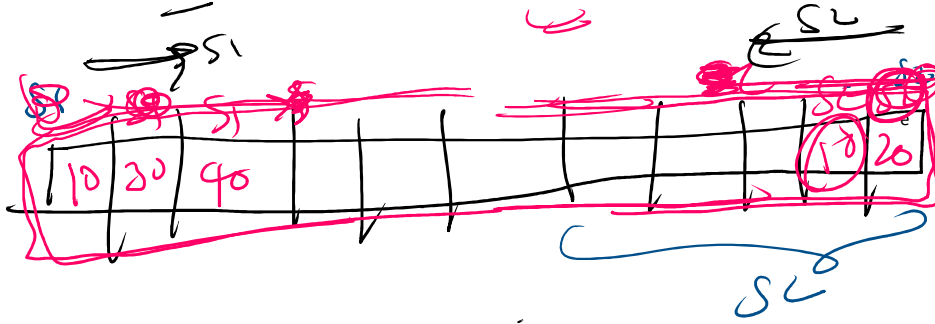
# Enqueue  $O(1)$



push(1)  
push(2)  
push(3)  
pop  
pop → push(4)

# 2 Stacks using a single array

# 2 stacks using a single array



if (S1 > S2)

push1(10)  
 push2(20)  
 pop1(30)  
 pop1(40)  
 pop1()  
 push2(50)  
 pop2()