

Adapters

- ① Implement Queue using 2 Stacks
- ② Implement Stack using 2 Queue

Implement Queue using 2 Stacks

enqueue

dequeue

peek

size $O(1)$

isEmpty $O(1)$

① Enqueue efficient

enqueue $O(1)$ dequeue $O(n)$

peek $O(n)$

② Dequeue efficient

dequeue $O(1)$ enqueue $O(n)$

peek $O(1)$

①



add(1)

add(2)

add(3)

remove

val = 1



main



helper

① Add push $O(1)$

② Remove

- ① pop $n-1$ and push helper $O(n)$
- ② pop helper push main $O(n)$

} $\Rightarrow O(n)$

② Deque Efficient $O(1)$

[1 | 2 | 3 | 4]

remove \rightarrow st. pop $O(1)$

1
2
3
4
5

main

helper

add (5) $O(n)$

② Implement Stack Using 2 Queues

① Push Efficient

push

pop

peek

size

isEmpty

push $O(1)$

pop $O(n)$

peek

② Pop Efficient

pop $O(1)$

push $O(n)$

peek $O(1)$

① Push Efficient

push(1)

push(2)

push(3)

4
3
2
1

main

1	2	3	4
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helper

1	2	3
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push \rightarrow q.add $O(1)$

pop

main = helper

helper = new LL

② Pop Efficient

4
3
2
1

main

4	3	2	1
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helper

5	4	3	2	1
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pop \rightarrow main.remove()

push(5)