# Lec-20

08/08/25 9:49 AM

add → push
set → push()
remove → pop()
size →
isEmpty

① STACK → LIFO

| |
|---|
| 30 |
| 20 |
| 10 |

A()
B()
C()
(C)

D
A

idx++
arr[idx]=item

idx=-1 0 1 2 3

void Push(int item){
arr[++idx] = item

①

10, 20, 30, 40, 50

arr
idx

| | |
|---|---|
| 10 | 20 |

40

size()
idx+1

| | | | |
|---|---|---|---|
| 10 | 20 | 30 | 40 |

0 1 2 3 4

pop

①

return arr[idx--]

x = arr[idx]
idx--
return x

push(10)
push(20)
(30)
(40)
(50)

arr
Queue
Stack

Queue → class → interface
↳ FIFO
↳ Linear
↳ Circular

front
rear
front

| | | | |
|---|---|---|---|
| 10 | 20 | 30 | 40 |

add enqueue
Remove dequeue
set
size
set front

9 4 0 5 6 7 8 3

f = 0 1 2 size = 0 1 2 3 4 5

```
public void Equeue(int item) throws Exception {
        if (isfull()) {
            throw new Exception("Bklol Queue is full");
        }
        //int idx = (front + size)%arr.length
        arr[idx] = item;
        size++;
    }
```

2+2=4
2+3=5
(front+size)%arr.length
f(4) = 6%5=1

Eq(10)
Eq(20)
Eq(30)
Eq(40)
deq()
deq()
Eq(50)
Eq(60)

int dequeue(){
x = arr[f]
front = (front+1)%arr.length
size--

| | | | | |
|---|---|---|---|---|
| 60 | 70 | 30 | 40 | 50 |

0 1 2 3 4

30 40 50 60

i=0 f+i = 2+0 = 2
i=1 f+i = 2+1 = 3
i=2 f+i = 2+2 = 4
i=3 f+i = 2+3 = 5

idx=(f+i)%

f

| | | | | |
|---|---|---|---|---|
| 60 | | 30 | 40 | 50 |

0 1 2 3 4

for(i=0 i<size i++){

10
20
30
40

Eq

deq()
deq()
Eq(50)
Eq(60)

| |
|---|
| 30 |
| 20 |
| 10 |

30 → 20 → 10 → 30

| |
|---|
| 30 |
| 20 |
| 10 |
| 7 |

size

| |
|---|
| 10 |
| 20 |
| 30 |

```
private static void Add(Stack<Integer> st, int item) {
        // TODO Auto-generated method stub
        if (st.isEmpty()) {
            st.push(item);
            return;
        }
        int x = st.pop();
        Add(st, item);
        st.push(x);
    }
```

| |
|---|
| 30 |
| 20 |
| 10 |
| 7 |

st

①

main

x=10
st.push(x)
x=20
st.push(x)
x=30
st.push(x)
st.push(x)

I I

7 8 9

1 2 3

I I I I

1 2 3 4 5

5 6 9
2 3 9
4 7 8

D D D

4 3 2

1 to 7
2 to 8
3 to 9

i=st.length()

0 1 2 3 4 5
D D I I D D

| | | | | | |
|---|---|---|---|---|---|
| 3 | 2 | 1 | 4 | 7 | 6 | 5 |

0 1 2 3 4 5 6

count = 2 4 8 2

0 1 2 3 4 5
D D I D D I

i=0

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 2 | 2 | 6 | 5 | 4 | 7 |

0 1 2 3 4 5 6

D D I i=0

| | | | |
|---|---|---|---|
| 4 | 3 | 2 | 1 |

0 1 2 3

| |
|---|
| 4 |
| 3 |

for(i=0 i<=st.length() i++){
if(i==st.length() || st.charAt(i) == 'I'){
arr[i] = count → count--
while(!st.isEmpty()){
arr[st.pop()] = count
count--
else
st.push(i)