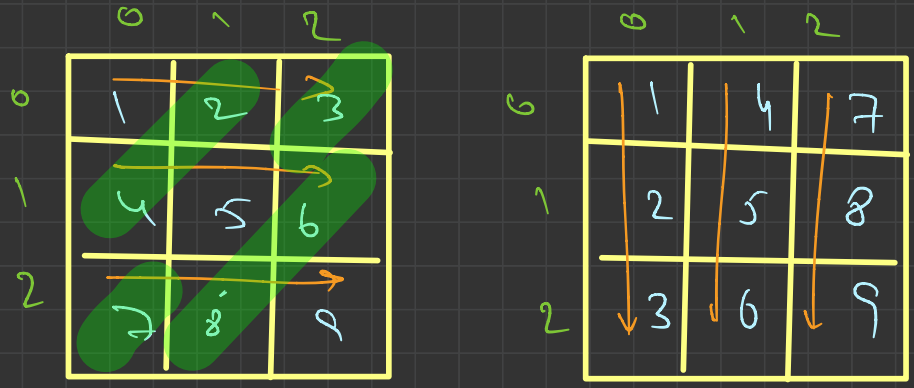
array questions

Transpose



Swapping

```
arr[0][0] <=> arr[0][0]
arr[1][0] <=> arr[0][1]
arr[2][0] <=> arr[0][2]
arr[2][1] <=> arr[1][2]
```

```
for (int i=0 ; i<row ; i++)
    for ( j=0 ; j<=i ; j++)
```

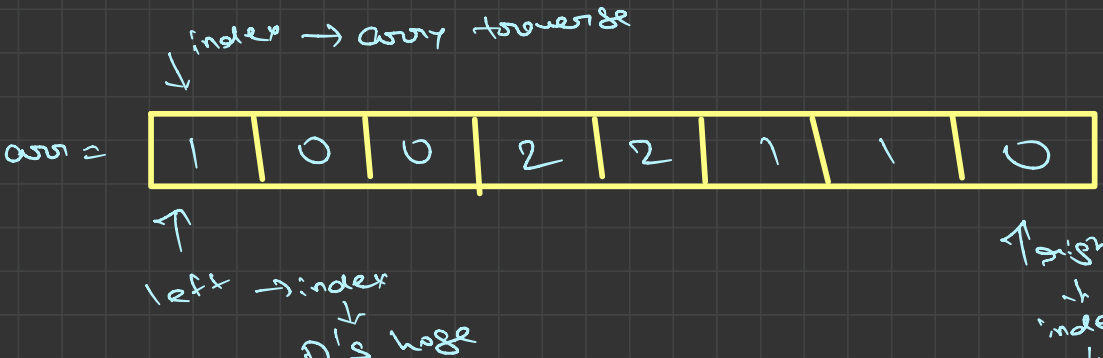
first half

Swap

```
    for (j=i ; j<col ; j++)
```

other half

Dutch national flag



Logic

0 → left
2 → right
1 → ignore

loop condition

index ≤ right

arr[index] = 1 ⇒ d → index ++
arr[index] = 0 → swap
↓
arr[index], arr[left]
↓
left ++, index ++

arr[index] = 2 → swap
↓
arr[index], arr[right]
↓
right --, index ++

Catch → Galti karunga

Mujhe nhi pata vo element swap hokar aayga vo kunga hi

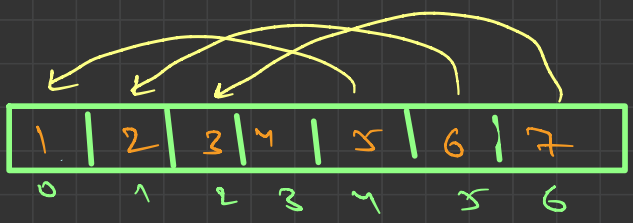
Rotate array

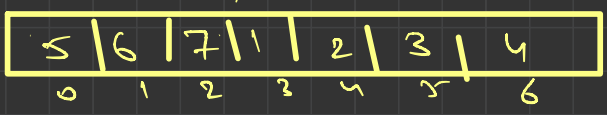
Methods

→ Reversal

→ Extra space method

$K = 3$





Reversal method

1) Reverse the whole array — 7 6 5 4 3 2 1
2) Reverse first K elements — 5 6 7 4 3 2 1
3) Reverse the remaining element — **5 6 7 1 2 3 4**

Edge case if $K = 9$

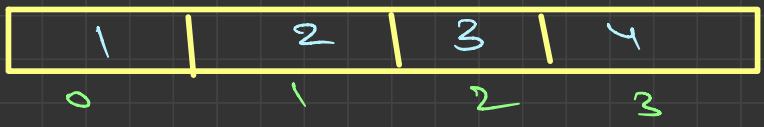
$K = K \% n$

Remember

$K = 0 == K = 7$
$K = 1 == K = 8$
$K = 2 == K = 9$
⋮ ⋮
$K = n == K = n+n$

K = 6

n = 4



K = K % n ⇒ 6 % 4 ⇒ 2

With this formula

Some

K = 1 → 4 1 2 3

K = 2 → 3 4 1 2

K = 3 → 2 3 4 1

K = 4 → 1 2 3 4

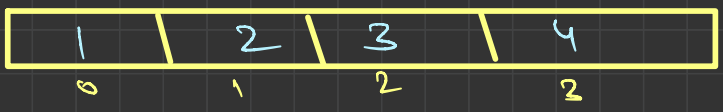
K = 5 → 4 1 2 3

K = 6 → 3 4 1 2

k<=3

Extra space using mod

arr =



arrNew =

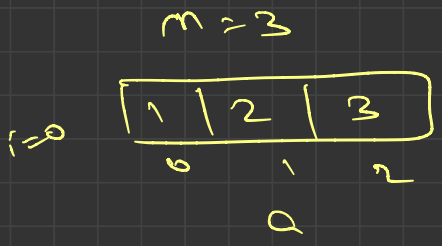
Using iteration n => 4

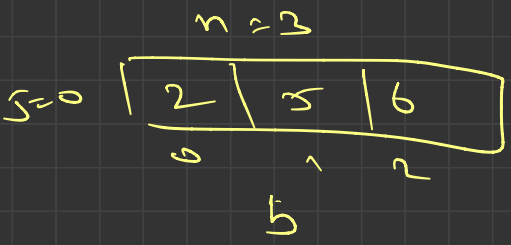
i = 0	1	i = 3
i = 1	2	i = 0
i = 2	3	i = 1
i = 3	4	i = 2

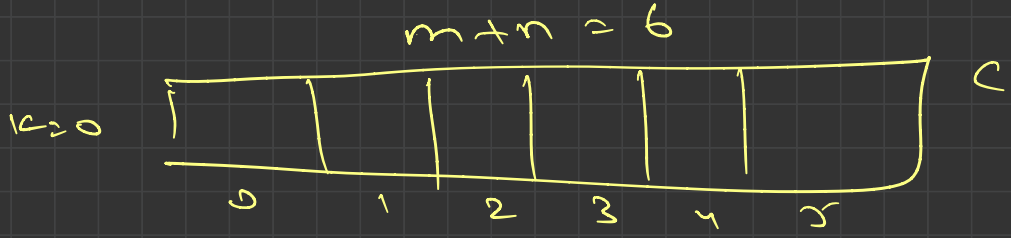
i + k -1. n => 0 + 3 -1. 4

3 -1. 4 = 3

1 + 3 -1. 4 => 4 -1. 4 = 0

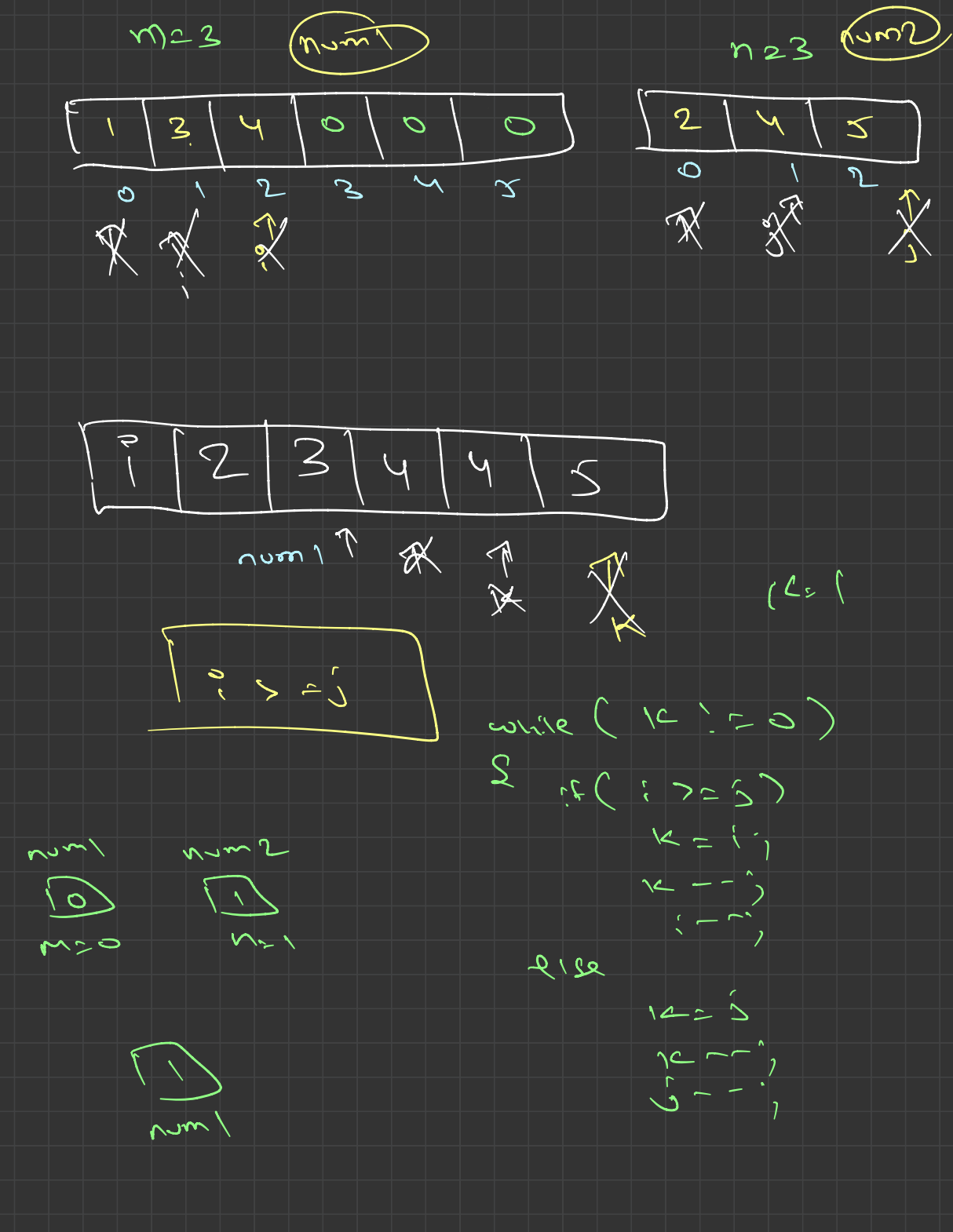






a[i] <= b[j]

```
while ( i < m && j < n)
{
    if ( a[i] <= b[j])
    {
        c[k] = a[i]
        i++; k++;
    }
    else
    {
        c[k] = b[j]
        j++; k++;
    }
```


m=3
num1
1 3 4 0 0 0
0 1 2 3 4 5
n=3
num2
2 4 5
0 1 2
1 2 3 4 4 5
num1
while (k != 0)
if (i >= j)
k = i ;
k --
i --
else
k = j ;
k --
j --
num1
0
m=0
num2
1
n=1
1
num1