

L24

Arrays - Practice 4

*Stay tuned for the System Design Course
Announcement.*

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RECAP

Pass by value

```
func (vector<int> v)
{
    fun(c);
}
```

40 bytes

```
int main()
```

```
{ vector<int> c;
```

```
    fun(c);
}
```

40 bytes

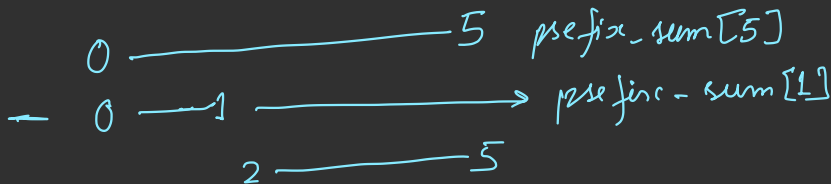
2	4	6	1	0	5	7
2	6	12	13	13	18	25

nums 2-5

prefix-sum

Range Sum Queries [important]

$$\text{prefix_sum}[i] = \text{nums}[i] + \text{prefix_sum}[i-1];$$



Given an array of all zeroes, then Q queries are given:

1. Each query has l, r, 1: Meaning 1 should be added to $\text{arr}[l]$, $\text{arr}[l+1]$... $\text{arr}[r]$.
2. Print the final state of the array after all the queries are processed.

$\begin{array}{cccccccc} & 1 & 11 & -1 & -1 & -1 & -2 & \\ \hline 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \end{array}$

Each Q $O(n)$
 Q query $O(Qn)$

$Q1 \rightarrow \underline{2 \quad 6} \quad 1$

0	0	1	1	1	1	1	0
0	1	2	3	4	5	6	7

$Q2 \rightarrow \underline{1-3} \quad 1$

0	1	2	2	1	1	1	0
0	1	2	3	4	5	6	7

$Q3 \rightarrow \underline{2-5} \quad 1$

0	1	3	3	2	2	1	0
0	1	2	3	4	5	6	7

1	1	2				-1	-2		-1
0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9

$$Q1 \quad \begin{array}{r} 3 \ 6 \\ \hline \end{array}$$

$$Q2 \quad \begin{array}{r} 3 \ 6 \\ \hline \end{array}$$

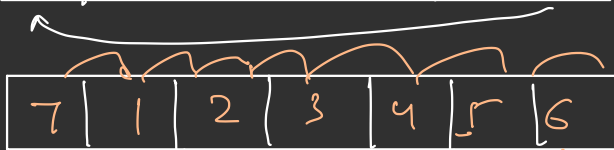
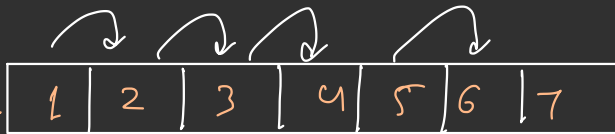
$$Q3 \quad \begin{array}{r} 1 \ 5 \\ \hline \end{array}$$

$$Q4 \quad \begin{array}{r} 2 \ 8 \\ \hline \end{array}$$

2	5	11	12	18	21	30
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0 7 14 21
 1 8 15
 2 9 16
 3 10 17
 4 11 18
 5 12 19
 6 13 20



Rotate Array by K towards right side



5 6 7 1 2 3 4
 4 5 6 7 1 2 3
 3 4 5 6 7 1 2
 2 3 4 5 6 7 1
 1 2 3 4 5 6 7

2 8 15

2 9 16

3 10 17

4 11

5 12

6 13

7 14

32
 $32 \% 7 = 4$

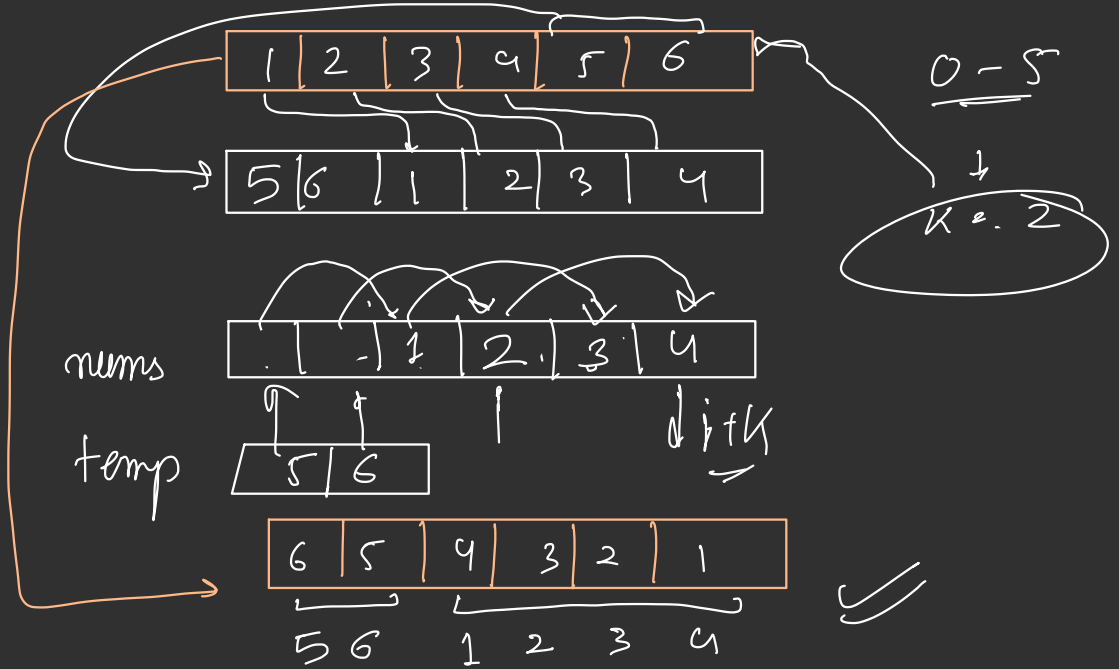
$$n = 6$$

$$K = 132 \quad 157 \quad K \%$$

$$K = K \% n$$

$$K \% = n$$

$$0 - n-1$$



Thank You!

Reminder: Going to the gym & observing the trainer work out can help you know the right technique, but you'll muscle up only if you lift some weights yourself.

So, PRACTICE, PRACTICE, PRACTICE!