Array : Video - 149

Leetcode - 2845

Medium

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Motivation -

The gap between who you are and who you want to be is built with daily bricks.

MIK...

Show up everyday if you want change.

2845. Count of Interesting Subarrays

Medium | Topics | Companies | Hint

You are given a **0-indexed** integer array `nums`, an integer `modulo`, and an integer `k`.

Your task is to find the count of subarrays that are **interesting**.

A **subarray** `nums[l..r]` is **interesting** if the following condition holds:

- Let `cnt` be the number of indices `i` in the range `[l, r]` such that `nums[i] % modulo == k`. Then, `cnt % modulo == k`.

Return *an integer denoting the count of interesting subarrays.*

Note: A subarray is *a contiguous non-empty sequence of elements within an array.*

Example :- nums = [3, 1, 9, 6]

K = 0, m = 3

Output :- 2

1st → {3, 1, 9, 6}

2nd → {1}

3 % 3 == K ✓

1 % 3 == K ✗

9 % 3 == K ✓

6 % 3 == K ✓

1 % m == K ✗

cnt = 0

cnt % m == K

0 % 3 == K

cnt = 3

cnt % m == K

3 % 3 == K ✓

Thought Process

nums = [3, 1, 9, 6]

3 % m == K

cnt = 1 + 1 = 2

~~modulo~~ m = 3

K = 0

[1 --- 2] cnt

[0 ... 2] 2 elements {3, 1, 9}

[0 .. 0] 1 elem {3}

⇒ 2 - 1

cnt = 1

[3 , 1, 9, 6] m = 3, K = 0

⇒ [1 , 0 , 1 , 1] (0, 1, 2, 3)

#

nums = { 3, 1, 9, 6 } m = 3, K = 0

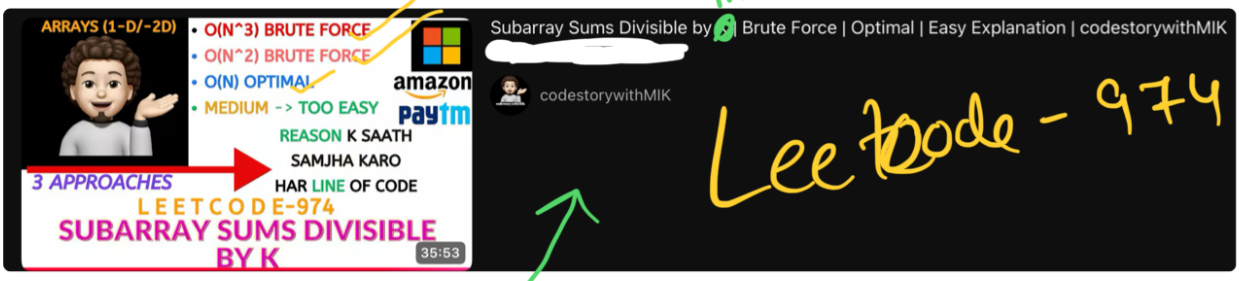
Subarray Sum → count

nums = { 1, 0, 1, 1 } (0, 1, 2, 3)

(count %. m == K)

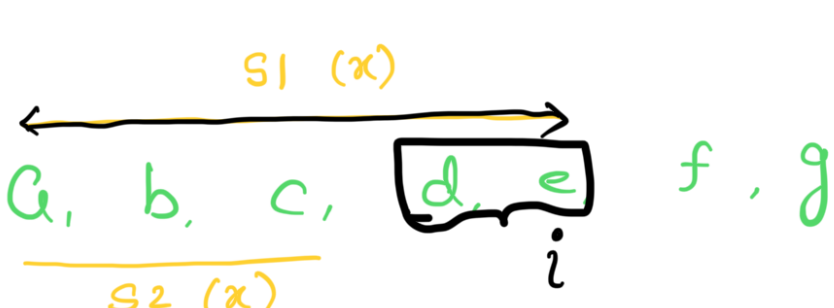
interesting.

"Find number of subarrays whose Sum (count) %m == k"



Sum %m == 0

Recap leetcode - 974



$S1 = qm + x$

$S2 = wm + x$

$$S1 - S2 = (q - w) * m$$

$$\Rightarrow (S1 - S2) = q * m$$

$$\Rightarrow \frac{(S1 - S2)}{m} = q$$

$$\rightarrow (S1 - S2) \,\%\, m = 0$$

$$(S1 - S2) \,\%\, m == K$$

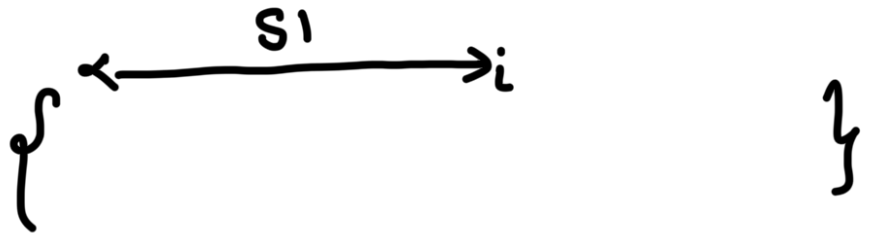
$$(S1 \,\%\, m - S2 \,\%\, m) \,\%\, m == K$$

$$(S1 \,\%\, m - S2 \,\%\, m + m) \,\%\, m == K$$

$$\downarrow \qquad \downarrow$$

$$(r1 - r2 + m) \,\%\, m == K$$

$$(r1 - K + m) \,\%\, m == r2$$



$S1 \% m = r1$

Leet - 974.

int r2 = (r1 - K + m) % m

if (mp.count(r2))

result += mp[r2];

mp[r1]++;

}

mp[0] = 1

0 1 2

{ 3, 6, 9 }

m = 3
K = 0

{ 1, 1, 1 }
i

count = 3

3 % m == 0

map

0	2
1	1

sum = 3, //

$r1 = 3 \,\%\, 3 = \underline{0}$

$r2 = (r1 - k + m) \,\%\, m$;

$= (0 - 0 + 3) \,\%\, m$

$= 0$

$r2 = 0$

2	1

result += mp[r2] ; //1

mp[r1]++;