560. Subarray Sum Equals K

Medium | Topics | Companies | Hint

Given an array of integers `nums` and an integer `k`, return *the total number of subarrays whose sum equals to* `k`.

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

Similar Problems:
#930
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Example 1:

```
Input: nums = [1,1,1], k = 2
Output: 2
```

Example 2:

```
Input: nums = [1,2,3], k = 3
Output: 2
```

Constraints:

- `1 <= nums.length <= 2 * 10^4`
- `-1000 <= nums[i] <= 1000`
- `-10^7 <= k <= 10^7`

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Approach 1: Brute force

$T(n) : O(n^2)$
$S(n) : O(1)$

Approach 2: Prefix Sum array + Hashmap

We can implement without using explicit prefix Sum array.

```
prefix = 0 , PSum = 0 , ans = 0

m[0] ++   i.e. taking 0 as one subarray

for (i : 0 to n-1)
{
    prefix = i==0 ? 0 : prefixSum
    PrefixSum = Prefix + nums[i]
    if ( m.find( prefixSum - k ) != m.end)
        ans = ans + m[prefixSum - k]

    m[prefixSum] ++
}
```

$T(n) : O(n)$
$S(n) : O(n)$