Approach 1: Prefix Sums and Counting前缀和与计数

**Intuition**

As is typical with problems involving subarrays, we use prefix sums to add each subarray. Let P[i+1] = A[0] + A[1] + ... + A[i]. Then, each subarray can be written as P[j] - P[i] (for j > i). Thus, we have P[j] - P[i] equal to 0 modulo K, or equivalently P[i] and P[j] are the same value modulo K.

P[i]为A[0]加到A[i]的前缀和，C[x]为前缀和为x的计数

**Algorithm**

Count all the P[i]'s modulo K. Let's say there are  *Cx*​ values  *P*[*i*]≡*x*(mod*K*). Then, there are ∑*x*​(2*Cx*​​)possible subarrays.

k=5

For example, take A = [4,5,0,-2,-3,1]. Then P = [0,4,9,9,7,4,5], and  *C*0​=2,*C*2​=1,*C*4​=4:

* With*C*0​=2 (at  *P*[0],  *P*[6]), it indicates C (22​)=1 subarray with sum divisible by *K*, namely  *A*[0:6]=[4,5,0,−2,−3,1].
* With  *C*4​=4 (at  *P*[1],  *P*[2],  *P*[3],  *P*[5]),

it indicatesC (24​)=6 subarrays with sum divisible by *K*, namely  *A*[1:2],  *A*[1:3],  *A*[1:5],  *A*[2:3],  *A*[2:5],  *A*[3:5].