

Given an array  $A$  of integers, return the number of (contiguous, non-empty) subarrays that have a sum divisible by  $K$ .

**Input:**  $A = [4, 5, 0, -2, -3, 1]$ ,  $K = 5$

**Output:** 7

**Explanation:** There are 7 subarrays with a sum divisible by  $K = 5$ :

$[4, 5, 0, -2, -3, 1]$ ,  $[5]$ ,  $[5, 0]$ ,  $[5, 0, -2, -3]$ ,  $[0]$ ,  $[0, -2, -3]$ ,  $[-2, -3]$

```
class Solution {
    public int subarraysDivByK(int[] A, int k) {
        int[] map = new int[k];
        map[0] = 1;
        int count = 0, sum = 0;
        for(int a : A) {
            sum = (sum + a) % k;
            if (sum < 0)
                sum += k;
            // Because  $-1 \% 5 = -1$ , but we need the
            positive mod 4
            count += map[sum];
            map[sum]++;
        }
        return count;
    }
}
```