446. Arithmetic Slices II – Subsequence

A sequence of numbers is called arithmetic if it consists of at least three elements and if the difference between any two consecutive elements is the same.

For example, these are arithmetic sequences:

1, 3, 5, 7, 9

7, 7, 7, 7

3, -1, -5, -9

The following sequence is not arithmetic.

1, 1, 2, 5, 7

A zero-indexed array A consisting of N numbers is given. A **subsequence** slice of that array is any sequence of integers (P0, P1, ..., Pk) such that 0 ≤ P0 < P1 < ... < Pk < N.

A **subsequence** slice (P0, P1, ..., Pk) of array A is called arithmetic if the sequence A[P0], A[P1], ..., A[Pk-1], A[Pk] is arithmetic. In particular, this means that k ≥ 2.

The function should return the number of arithmetic subsequence slices in the array A.

The input contains N integers. Every integer is in the range of -231 and 231-1 and 0 ≤ N ≤ 1000. The output is guaranteed to be less than 231-1.

**Example:**

**Input:** [2, 4, 6, 8, 10]

**Output:** 7

**Explanation:**

All arithmetic subsequence slices are:

[2,4,6]

[4,6,8]

[6,8,10]

[2,4,6,8]

[4,6,8,10]

[2,4,6,8,10]

[2,6,10]

例子 [2,3,4,4,4,5]

根本思路： 假如原来等差数列2，3，4 共有n 个差为1的等差数列，假如加入一个5在后边。以5为结束，差为1的数列增加了n +１个，因为３，４原来太短，不算是等差，但是加入５，就够长了。等差数列由于５的加入增加了ｎ＋１个，可以累加到输出计数器中

假如，２３４４４５，到达５位置时，由于前边有多个４　都可以跟５构成等差为１的等差数列。我们原本可以将每个４到５都变成一个ｌｉｓｔ来存放。例如map[5].get(1) = {2, 2,2} ，假如下一个数字是6. Map[6].get(1) = { 3, 3, 3,} 等差数列增加了 3 × 3个

我们用array of hashmap 来存放中间结果，map key是在当前元素结束，等差为key，至今为止等差数列个数

因为例如 2,3,3,4 在4位置，我们加入了两个等差数列，

{}

{1=1}

{1=2, 2=1}

{0=1, 1=2, 2=1}

{0=3, 1=2, 2=1}

{1=9, 2=1, 3=1}