Arithmetic Slices

Question body:

A sequence of number 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 sequence:

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 slice of that array is any pair of integers (P, Q) such that 0 <= P < Q < N.

A slice (P, Q) of array A is called arithmetic if the sequence:

A[P], A[p + 1], ..., A[Q - 1], A[Q] is arithmetic. In particular, this means that P + 1 < Q.

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

key idea:

The key idea of solving this question is to spot that given a arithmetic slice with size N, the number of sub-arithmetic slice is Renman sum of (N-2)+(N-1-2)…(3-2)

Given the result above, the rest is just to find the arithmetic slice inside the array. The result will be the sum of number of sub arithmetic slices of each arithmetic slide.

Solution:

public class Solution {

public int numberOfArithmeticSlices(int[] A) {

if(A.length < 3) return 0;

int result=0;

int size = 2;

for(int index = 2; index< A.length; index++){

int currentDiff = A[index] - A[index-1];

int preDiff = A[index-1] - A[index-2];

if(currentDiff==preDiff){

size++;

}else{

result += numSubSlice(size);

size=2;

}

}

result += numSubSlice(size);

return result;

}

public int numSubSlice(int size){

int result=0;

while(size>=3){

result += (size-2);

size--;

}

return result;

}

}