Sequence Hunt

As you know in Arithmetic Progression (A.P.) difference between every two consecutive terms remains constant; whereas in Geometric Progression (G.P.) ratio of every two consecutive terms remains same. Consider the example:

2 5 8 11 is A.P. having common difference 3. 2 6 18 54 is G.P. having common ratio of 3.

You have some sequences, where each sequence has multiple sub sequences (either A.P. or G.P.) mixed as elaborated by following examples:

1	2 5 6 8 10 11	First subsequence is an A.P. [2 6 10] Second subsequence is also an A.P. [5 8 11]
2	2 5 10 15 50 45 250 135	First subsequence is a G.P. [2 10 50 250] Second subsequence is also a G.P. [5 15 45 135]
3	2 5 5 10 8 20 11 40	First subsequence is an A.P. [2 5 8 11] Second subsequence is a G.P. [5 10 20 40]

Each sequence of n numbers may have 1 upto n/3 sub sequences because to get common difference or ratio minimum 3 elements are required. Each ith sequence starts from ith location as you have noticed in above examples, it can be observed in Input / Output section. Your task is to analyze each sequence and identify no of subsequences that can be 1 or more. Moreover, you have to find type of each subsequence and elements of individual sub sequence.

Input:
The first line has integer N (the number of mixed sequences), followed by N lines each contains mixed sequences. Each of the next N lines contains C+1 integers staring with C followed by the mixed sequence of C elements.

Constraint:
1 <= N < 1000
3 <= C < 1000
Every number is in the range of 4 byte integer.

Output:
For each sequence output shows count of subsequences, type of each subsequence followed by corresponding subsequence.

Sample Input	Sample Output
4 **6 2 5 6 8 10 11** **8 2 5 10 15 50 45 250 135** **8 2 5 5 10 8 20 11 40** **12 2 5 7 5 10 14 8 20 21 11 40 28**	**Count=2** **AP 2 6 10** **AP 5 8 11** **Count=2** **GP 2 10 50 250** **GP 5 15 45 135** **Count=2** **AP 2 5 8 11** **GP 5 10 20 40** **Count=3** **AP 2 5 8 11** **GP 5 10 20 40** **AP 7 14 21 28**