

Jolly Wheel

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 1024 mebibytes

You have a round wheel. The length of its perimeter along the outer circumference is k meters.

You drew a long straight line on a flat surface and placed the wheel on it, then performed the following action n times: roll the wheel along the line, alternating the direction. That is, if during the i -th action the wheel rolled forwards, then during the $(i + 1)$ -th action it rolled backwards, and vice versa. During the i -th action, the wheel traveled exactly a_i meters.

Now you would like to know the minimum and maximum number of times any point on the outer circumference of the wheel touched the surface.

Input

The first line contains an integer t ($1 \leq t \leq 10^5$), denoting the number of test cases.

Then, t test case descriptions follow. The first line of a description contains two integers n and k ($1 \leq n \leq 3 \cdot 10^5$, $1 \leq k \leq 10^{18}$), denoting the number of actions and the perimeter of the wheel, respectively.

The second line contains n integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq 10^{12}$), denoting the distances the wheel traveled during the first, second, \dots , n -th actions.

It is guaranteed that the sum of n across all test cases does not exceed $3 \cdot 10^5$.

Output

For each test case, print two integers: the minimum and maximum number of times any point on the outer circumference of the wheel touched the surface.

Example

standard input	standard output
2	4 5
3 4	0 2
4 8 4	
2 7	
6 5	

Note

Note that in this problem, the input and output data can be quite large. It is recommended to use means of speeding up operations with input and output data that are available in your programming language.