



COMEBACK

After going in the Public Garden, Antonio returns home, where he finds a string of n non-negative integers and a number X . Feeling bored, he decides to invent a game with this array in n steps. Therefore, at each step, Antonio performs 2 actions:

1. He determines all the subsequences of the array whose sums are smaller or equal to X and keeps in mind the sum of the sums of such subsequences and their number.
2. He circularly permutes the array to the left with one position.

TASK

Determine the values kept in mind by Antonio at each step.

INPUT FORMAT

The first line of the input file *comeback.in* contains the numbers n and X .

On the second line of this file there are n space-separated elements corresponding to the array.

OUTPUT FORMAT

The output file *comeback.out* has n lines:

The i^{th} line contains two integers separated by a space, the sum of the sums of valid subsequences at step i and their number.

LIMITS AND CONSTRAINTS

- $n \leq 100.000$, $X \leq 1.000.000.000$
- The elements of the array are between 0 and 10^6 .
- A subsequence of the given array consists of elements found on consecutive positions.

SUBTASKS

Subtask	Score	Additional input constraints
1	40	$n \leq 1.000$
2	100	$n \leq 100.000$

EXAMPLE

<i>comeback.in</i>	<i>comeback.out</i>
3 5	14 5
1 2 3	15 5
	13 5

EXPLANATIONS

Stage 1. The sum of the sums of valid subsequences: $1 + 2 + 3 + (1 + 2) + (2 + 3) = 14$
There are 5 valid subsequences.



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The array becomes 2, 3, 1.

Stage 2. The sum of the sums of valid subsequences: $2 + 3 + 1 + (2 + 3) + (3 + 1) = 15$
There are 5 valid subsequences.

The array becomes 3, 1, 2.

Stage 3. The sum of the sums of valid subsequences: $3 + 1 + 2 + (3 + 1) + (1 + 2) = 13$
There are 5 valid subsequences.

The array becomes 1, 2, 3.