

Huge tower

Problem name	Huge tower
Input file	standard input
Output file	standard output
Time limit	3 seconds
Memory limit	256 megabytes

Mouse Binna decided to build a huge tower. The tower consists of n cubic building blocks that are stacked one onto another. Binna gathered many building blocks of various sizes. From her last unsuccessful attempt she learned that if a large block is placed directly onto a much smaller block, the tower will fall.

Each two building blocks are different, even if they have the same size. For each building block you are given its side length. You are also given an integer d with the following meaning: you are not allowed to put block A directly onto block B if the side length of A is strictly larger than d plus the side length of B .

Compute the number of different ways in which it is possible to build the tower using all the building blocks. Since this number can be very large, output the result modulo $10^9 + 9$.

Input

The first line of the input contains two positive integers n and d ($1 \leq n \leq 10^6$, $1 \leq d \leq 10^{18}$) – the number of building blocks and the tolerance respectively.

The second line contains n space-separated integers $a_1, a_2, \dots, a_i, \dots, a_n$ ($1 \leq a_i \leq 10^{18}$); each represents the size of one building block.

Output

Output a single line containing a single integer: the number of towers that can be built, modulo $10^9 + 9$.

Scoring

Subtask 1 (10 points): $n \leq 10$.

Subtask 2 (35 points): $n \leq 20$.

Subtask 3 (25 points): $n \leq 70$.

Subtask 4 (15 points): $n \leq 2000$.

Subtask 5 (15 points): there are no additional constraints.

Examples

standard input	standard output
4 1 1 2 3 100	4
6 9 10 20 20 10 10 20	36

Note

In the first example, we can arrange the first three blocks in any order, except for 2,1,3 or 1,3,2. The last block has to be at the bottom.

In the second example, we are not allowed to put a cube of size 20 onto a cube of size 10. There are six ways to order the cubes of size 10, and six ways to order the cubes of size 20.