I. NIM

Alice and Bob are going to play a variation of Nim.

To set up the game, first Bob chooses a strictly increasing sequence of N integers: A_1, A_2, A_3, ..., A_N. Then, Alice arranges K piles of stones in a row. The number of stones in each pile must be a number in Bob's sequence. All piles are distinct from each other, so there is a total of N^K different starting configurations.

Alice and Bob take turns making moves, with Alice going first. For each move, a player must choose 1 or 2 piles and remove a positive number of stones from each of the chosen piles. It is allowed to remove different amounts of stones from each pile. The player who cannot make a valid move loses.

Assuming Alice and Bob play optimally, count the number of different starting configurations that result in Alice losing and Bob winning. Since the answer may be large, print it modulo $10^9 + 9$.

INPUT

The first line contains two positive integers N and K - the length of Bob's sequence, and the number of piles of stones. ($1 \le N \le 1000$, $1 \le K \le 10^{18}$)

The second line contains N integers A_1, A_2, A_3, ..., A_N - the numbers in Bob's sequence. ($1 \le A_1 < A_2 < \ldots < A_N \le 1000$)

OUTPUT

Print the answer, modulo $10^9 + 9$.

Sample Input	Sample Output
2 3 1 2	2
9 123456789 1 2 3 4 5 6 7 8 9	552110917