

Digidivisible Numbers

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 512 megabytes

Let's call a number *digidivisible* in base B , if it is divisible by all digits in its base B representation. For example, 728_{10} is divisible by 7, 2 and 8, so it is digidivisible in base 10, and number $264_8 = 180_{10}$ is divisible by 2, 6 and 4, so it is digidivisible in base 8.

You are given integers B and n , and some set of allowed digits from 1 to $B - 1$. Find the number of digidivisible numbers consisting of n digits in base B , only containing these allowed digits. Solve this problem for some fixed n and B and for multiple sets of allowed digits.

Input

The first line contains two integers B and n ($2 \leq B \leq 10$; $1 \leq n \leq 10^9$). The second line contains an integer t ($1 \leq t \leq 2^{B-1} - 1$) — the number of sets of allowed digits you need to solve this problem for.

Then, t lines follow, i -th line contains a single string s_i , consisting of B zeros and ones. If $s_{i,k} = 1$ (indices begin with 0), then digit k is allowed, otherwise digit k is forbidden. Each set has at least one allowed digit, and digit 0 is always forbidden. All t sets are distinct.

Output

For each one of the t sets print the answer in a separate line. Because the result might be huge, print it modulo 999 999 001.

Scoring

Subtask	Points	Constraints
1	8	$B = 10, n \leq 5, t = 1$ all digits except 0 are allowed
2	9	$B \leq 10, B^n \leq 10^5, t = 1$
3	9	$B \leq 10, B^n \leq 10^5$
4	32	$B \leq 10, n \leq 50$
5	13	$B \leq 6, n \leq 10^9$
6	14	$B \leq 8, n \leq 10^9$
7	15	$B \leq 10, n \leq 10^9$

Example

standard input	standard output
10 3 2 0111111111 0010101010	56 17

Note

Total number of 3-digit digidivisible numbers in base 10 is 56. If we only allow even digits, then there are 17 numbers left: 222, 224, 244, 248, 264, 288, 424, 444, 448, 488, 624, 648, 666, 824, 848, 864, 888.