☆ Magic Numbers CodeForces - 628D

Consider the decimal presentation of an integer. Let's call a number `d-magic` if digit d appears in decimal presentation of the number on even positions and nowhere else.

For example, the numbers 1727374, 17, 1 are `7-magic` but 77, 7, 123, 34, 71 are not `7-magic`. On the other hand the number 7 is `0-magic`, 123 is `2-magic`, 34 is `4-magic` and 71 is `1-magic`.

Find the number of `d-magic` numbers in the segment $[a, b]$ that are multiple of m. Because the answer can be very huge you should only find its value modulo $10^9 + 7$ (so you should find the remainder after dividing by $10^9 + 7$).

Input

The first line contains two integers m, d ($1 \le m \le 2000$, $0 \le d \le 9$) — the parameters from the problem statement.

The second line contains positive integer a in decimal presentation (without leading zeroes).

The third line contains positive integer b in decimal presentation (without leading zeroes).

It is guaranteed that $a \le b$, the number of digits in a and b are the same and don't exceed 2000.

Output

Print the only integer a — the remainder after dividing by $10^9 + 7$ of the number of `d-magic` numbers in segment $[a, b]$ that are multiple of m.

Sample 1

Input	Output
2 6 10 99	8

Sample 2

Input	Output
2 0 1 9	4

Sample 3

Input	Output
19 7 1000 9999	6

Note

The numbers from the answer of the first example are 16, 26, 36, 46, 56, 76, 86 and 96.

The numbers from the answer of the second example are 2, 4, 6 and 8.

The numbers from the answer of the third example are 1767, 2717, 5757, 6707, 8797 and 9747.

☆ Perfect Number

CodeForces - 919B

We consider a positive integer perfect, if and only if the sum of its digits is exactly 10.
Given a positive integer k, your task is to find the k-th smallest perfect positive integer.

Input

A single line with a positive integer k ($1 \leq k \leq 10\,000$).

Output

A single number, denoting the k-th smallest perfect integer.

Sample 1

Input	Output
1	19

Sample 2

Input	Output
2	28

Note

The first perfect integer is 19 and the second one is 28.

☆ Explosion Exploit

Gym - 101933E

In a two player card game, you have n minions on the board and the opponent has m minions. Each minion has a health between 1 and 6.

You are contemplating your next move. You want to play an "Explosion" spell which deals d units of damage randomly distributed across all minions. The damage is dealt one unit at a time to some remaining minion on the board. Each living minion (including your own) has the same chance of receiving each unit of damage. When a minion receives a unit of damage, its health is decreased by one. As soon as the health of a minion reaches zero, it is immediately removed from the board, before the next damage is dealt. If there are no minions left on the board, any excess damage caused by the spell is ignored.

Given the current health of all minions, what is the probability that the Explosion will remove all of the opponent's minions? Note that it does not matter if all your own minions die in the process as well, and the damage continues to be dealt even if all your own minions are gone.

Input

The first line of input contains the three integers n, m, and d ($1 \leq n, m \leq 5$, $1 \leq d \leq 100$). Then follows a line containing n integers, the current health of all your minions. Finally, the third line contains m integers, the current health of all the opponent's minions. All healths are between 1 and 6 (inclusive).

Output

Output the probability that the Explosion removes all the opponent's minions, accurate up to an absolute error of 10^{-6}.

Sample 1

Input	Output
1 2 2 2 1 1	0.33333333

Sample 2

Input	Output
2 3 12 3 2 4 2 3	0.13773809

☆ Campus Design HDU - 4804

Nanjing University of Science and Technology is celebrating its 60th anniversary. In order to make room for student activities, to make the university a more pleasant place for learning, and to beautify the campus, the college administrator decided to start construction on an open space.
The designers measured the open space and come to a conclusion that the open space is a rectangle with a length of n meters and a width of m meters. Then they split the open space into n x m squares. To make it more beautiful, the designer decides to cover the open space with 1 x 1 bricks and 1 x 2 bricks, according to the following rules:

1. All the bricks can be placed horizontally or vertically
2. The vertexes of the bricks should be placed on integer lattice points
3. The number of 1 x 1 bricks shouldn't be less than C or more than D. The number of 1 x 2 bricks is unlimited.
4. Some squares have a flowerbed on it, so it should not be covered by any brick. (We use 0 to represent a square with flowerbet and 1 to represent other squares)

Now the designers want to know how many ways are there to cover the open space, meeting the above requirements.

Input

There are several test cases, please process till EOF.
Each test case starts with a line containing four integers N(1 <= N <= 100), M(1 <= M <= 10), C, D(1 <= C <= D <= 20). Then following N lines, each being a string with the length of M. The string consists of '0' and '1' only, where '0' means the square should not be covered by any brick, and '1' otherwise.

Output

Please print one line per test case. Each line should contain an integers representing the answer to the problem (mod $10^9 + 7$).

Sample

Input	Output
`` 1 1 0 0 1 1 1 1 2 0 1 1 1 2 1 1 2 1 2 11 1 2 0 2 01 1 2 0 2 11 2 2 0 0 10 10 2 2 0 0 01 10 2 2 0 0 11 11 4 5 3 5 11111 11011 10101 11111 ```	``` 0 0 1 1 1 2 1 0 2 954 ```