A - Iroha and Haiku (ABC Edition)

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 100 points

Problem Statement

Iroha loves *Haiku*. Haiku is a short form of Japanese poetry. A Haiku consists of three phrases with 5, 7 and 5 syllables, in this order.

To create a Haiku, Iroha has come up with three different phrases. These phrases have A, B and C syllables, respectively. Determine whether she can construct a Haiku by using each of the phrases once, in some order.

Constraints

- $1 \leqq A, B, C \leqq 10$

Input

The input is given from Standard Input in the following format:

A B C

Output

If it is possible to construct a Haiku by using each of the phrases once, print `YES` (case-sensitive). Otherwise, print `NO`.

Sample Input 1

```
5 5 7
```

Sample Output 1

```
YES
```

Using three phrases of length 5, 5 and 7, it is possible to construct a Haiku.

Sample Input 2

```
7 7 5
```

Sample Output 2

```
NO
```

B - Iroha Loves Strings (ABC Edition)

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 200 points

Problem Statement

Iroha has a sequence of N strings S_1, S_2, ..., S_N. The length of each string is L.

She will concatenate all of the strings in some order, to produce a long string.

Among all strings that she can produce in this way, find the lexicographically smallest one.

Here, a string $s = s_1 s_2 s_3 ... s_n$ is *lexicographically smaller* than another string $t = t_1 t_2 t_3 ... t_m$ if and only if one of the following holds:

- There exists an index $i (1 \leqq i \leqq min(n, m))$, such that $s_j = t_j$ for all indices $j (1 \leqq j < i)$, and $s_i < t_i$.
- $s_i = t_i$ for all integers $i (1 \leqq i \leqq min(n, m))$, and $n < m$.

Constraints

- $1 \leqq N, L \leqq 100$
- For each i, the length of S_i equals L.
- For each i, S_i consists of lowercase letters.

Input

The input is given from Standard Input in the following format:

N L
S_1
S_2
:
S_N

Output

Print the lexicographically smallest string that Iroha can produce.

Sample Input 1

```
3 3
dxx
axx
cxx
```

Sample Output 1

```
axxcxxdxx
```

The following order should be used: axx, cxx, dxx.

C - Iroha's Obsession

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 300 points

Problem Statement

Iroha is very particular about numbers. There are K digits that she dislikes: $D_1, D_2, ..., D_K$.

She is shopping, and now paying at the cashier. Her total is N yen (the currency of Japan), thus she has to hand at least N yen to the cashier (and possibly receive the change).

However, as mentioned before, she is very particular about numbers. When she hands money to the cashier, the decimal notation of the amount must not contain any digits that she dislikes. Under this condition, she will hand the minimum amount of money.

Find the amount of money that she will hand to the cashier.

Constraints

- $1 \leqq N < 10000$
- $1 \leqq K < 10$
- $0 \leqq D_1 < D_2 < \ldots < D_K \leqq 9$
- $\{D_1, D_2, ..., D_K\} \neq \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

Input

The input is given from Standard Input in the following format:

N K
D_1 D_2 ... D_K

Output

Print the amount of money that Iroha will hand to the cashier.

Sample Input 1

```
1000 8
1 3 4 5 6 7 8 9
```

Sample Output 1

```
2000
```

She dislikes all digits except 0 and 2.

The smallest integer equal to or greater than $N = 1000$ whose decimal notation contains only 0 and 2, is 2000.

Sample Input 2

```
9999 1
0
```

Sample Output 2

```
9999
```

D - Iroha and a Grid

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 400 points

Problem Statement

We have a large square grid with H rows and W columns. Iroha is now standing in the top-left cell. She will repeat going right or down to the adjacent cell, until she reaches the bottom-right cell.

However, she cannot enter the cells in the intersection of the bottom A rows and the leftmost B columns. (That is, there are $A \times B$ forbidden cells.) There is no restriction on entering the other cells.

Find the number of ways she can travel to the bottom-right cell.

Since this number can be extremely large, print the number modulo $10^9 + 7$.

Constraints

- $1 \leqq H, W \leqq 100,000$
- $1 \leqq A < H$
- $1 \leqq B < W$

Input

The input is given from Standard Input in the following format:

$$H \quad W \quad A \quad B$$

Output

Print the number of ways she can travel to the bottom-right cell, modulo $10^9 + 7$.

Sample Input 1

```
2 3 1 1
```

Sample Output 1

```
2
```

We have a 2×3 grid, but entering the bottom-left cell is forbidden. The number of ways to travel is two: "Right, Right, Down" and "Right, Down, Right".

Sample Input 2

```
10 7 3 4
```

Sample Output 2

```
3570
```

There are 12 forbidden cells.

Sample Input 3

```
100000 100000 99999 99999
```

Sample Output 3

```
1
```

Sample Input 4

```
100000 100000 44444 55555
```

Sample Output 4

```
738162020
```