Educational DP Contest AtCoder R - Walk

Time limit: 0.6s **Memory limit:** 1G

There is a simple directed graph G with N vertices, numbered $1, 2, \ldots, N$.

For each i and j $(1 \leq i, j \leq N)$, you are given an integer $a_{i,j}$ that represents whether there is a directed edge from Vertex i to j. If $a_{i,j} = 1$, there is a directed edge from Vertex i to j; if $a_{i,j} = 0$, there is not.

Find the number of different directed paths of length K in G, modulo $10^9 + 7$. We will also count a path that traverses the same edge multiple times.

Constraints

- All values in input are integers.
- $1 \leq N \leq 50$
- $1 \leq K \leq 10^{18}$
- $a_{i,j}$ is 0 or 1.
- $a_{i,i} = 0$

Input Specification

The first line will contain 2 space separated integers N, K.

The next N lines will each contain N space separated integers, $a_{i,j}$.

Output Specification

Print the number of different directed paths of length K in G, modulo $10^9 + 7$.

Sample Input 1

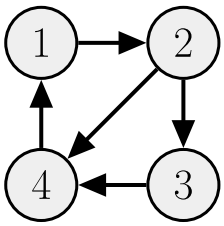
```
4 2
0 1 0 0
0 0 1 1
0 0 0 1
1 0 0 0
```

Sample Output 1

```
6
```

Explanation For Sample 1

G is drawn in the figure below:



There are six directed paths of length 2:

- $1 \to 2 \to 3$
- $1 \to 2 \to 4$
- $2 \to 3 \to 4$
- $2 \to 4 \to 1$
- $3 \to 4 \to 1$
- $4 \to 1 \to 2$

Sample Input 2

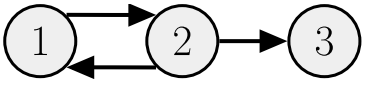
```
3 3
0 1 0
1 0 1
0 0 0
```

Sample Output 2

```
3
```

Explanation For Sample 2

G is drawn in the figure below:



There are three directed paths of length 3:

- $1 \to 2 \to 1 \to 2$
- $2 \to 1 \to 2 \to 1$
- $2 \to 1 \to 2 \to 3$

Sample Input 3

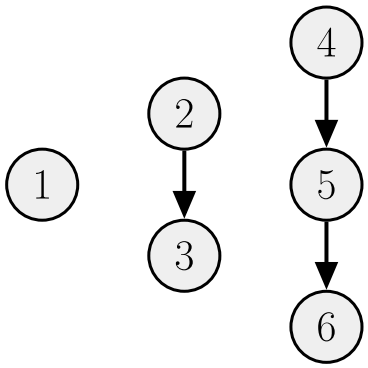
```
6 2
0 0 0 0 0 0
0 0 1 0 0 0
0 0 0 0 0 0
0 0 0 0 1 0
0 0 0 0 0 1
0 0 0 0 0 0
```

Sample Output 3

```
1
```

Explanation For Sample 3

G is drawn in the figure below:



There is one directed path of length 2:

- $4 \to 5 \to 6$

Sample Input 4

```
1 1
0
```

Sample Output 4

```
0
```

Sample Input 5

```
10 1000000000000000000
0 0 1 1 0 0 0 1 1 0
0 0 0 0 0 1 1 1 0 0
0 1 0 0 0 1 0 1 0 1
1 1 1 0 1 1 0 1 1 0
0 1 1 1 0 1 0 1 1 1
0 0 0 1 0 0 1 0 1 0
0 0 0 1 1 0 0 1 0 1
1 0 0 0 1 0 1 0 0 0
0 0 0 0 0 1 0 0 0 0
1 0 1 1 1 0 1 1 1 0
```

Sample Output 5

```
957538352
```

Explanation For Sample 5

Be sure to print the count modulo $10^9 + 7$.