F. Little Artem and Graph

Little Artem is given a graph, constructed as follows: start with some k-clique, then add new vertices one by one, connecting them to k already existing vertices that form a k-clique.

Artem wants to count the number of spanning trees in this graph modulo $10^9 + 7$.

Input

First line of the input contains two integers n and k ($1 \leq n \leq 10\,000$, $1 \leq k \leq min(n, 5)$) — the total size of the graph and the size of the initial clique, respectively.

Next n - k lines describe $k + 1$-th, $k + 2$-th, ..., i-th, ..., n-th vertices by listing k distinct vertex indices $1 \leq a_{ij} < i$ it is connected to. It is guaranteed that those vertices form a k-clique.

Output

Output a single integer — the number of spanning trees in the given graph modulo $10^9 + 7$.

Examples

input

```
3 2
1 2
```

output

```
3
```

input

```
4 3
1 2 3
```

output

```
16
```