

Different Vectors

You are given set of N vectors, each vector consists of K integers. Vector ex equals ey **iff** there exist function bijection f and integer r , such that $ex[i] = f(ey[(i+r)\%K])$, for each i in range $[0, K)$. Eg. $(1, 2, 2, 3) == (22, 3, 4, 22)$, with $r=2$ and $f(22)=2, f(3)=3$ and $f(4)=1$. But $(22,3,22,4)$ is not equal to $(1, 2, 2, 3)$.

How many different vectors are there in set of N given vectors ?

Constraints :

$n \leq 10000$

$k \leq 100$

vector values are from range $[0, 10^9]$

Input

First number contains T ($T \leq 10$), number of test cases. Each test cases consists of following. First line consists of N and K . N lines follows, the i -th containing K integers describing i -th vector.

Output

Output one number, number of different vectors.

Input:

```
2
3 4
22 3 4 22
1 2 2 3
22 3 22 4
5 5
3 3 3 0 3
8 4 4 4 0
1 1 1 1 1
1 1 8 6 1
1 3 3 3 5
```

Output:

```
2
3
```