



## Task 1: Topical

Benson the Rabbit is attending pilot school!

He has  $n$  modules to complete, numbered from 1 to  $n$ . There are  $k$  topics in flying numbered from 1 to  $k$ . As Benson is new to flying, he starts with zero knowledge in each topic.

Each of these  $n$  modules have a knowledge requirement to complete them. In particular, to complete module  $i$ , Benson requires at least  $r[i][j]$  knowledge of topic  $j$  for all topics  $j$ .

Completing a module also allows Benson to gain knowledge in some topics. After completing module  $i$ , he will gain  $u[i][j]$  knowledge in topic  $j$ .

Formally, let Benson's knowledge in topic  $j$  be  $p[j]$ . Initially,  $p[j] = 0$  for all  $j$ . He can only complete a module  $i$  if  $p[j] \geq r[i][j]$  for every topic  $j$ . After completing module  $i$ , the value of  $p[j]$  increases by  $u[i][j]$  for each topic  $j$ .

Benson may complete the modules in any order, but each module may only be completed at most once. Help Benson determine the maximum number of modules he can complete.

### Input format

Your program must read from standard input.

The first line of input contains 2 space-separated integers,  $n$  and  $k$ .

Then,  $n$  lines will follow. The  $i$ -th ( $1 \leq i \leq n$ ) of these lines contains  $k$  spaced integers  $r[i][1], r[i][2], \dots, r[i][k]$ , denoting the knowledge requirements to complete module  $i$ .

Another  $n$  lines follow. The  $i$ -th ( $1 \leq i \leq n$ ) of these lines contains  $k$  spaced integers  $u[i][1], u[i][2], \dots, u[i][k]$ , denoting the knowledge gained after completing module  $i$ .

### Output format

Your program must print to standard output.

The output should contain one integer, the maximum number of modules Benson can complete.

The output should contain only a single integer. Do not print any additional text such as 'Enter a number' or 'The answer is'.



## Subtasks

For all testcases, the input will satisfy the following bounds:

- $1 \leq n, k \leq 10^6$
- $n \cdot k \leq 10^6$
- $0 \leq u[i][j], r[i][j] \leq 10^9$  (for all  $1 \leq i \leq n$  and  $1 \leq j \leq k$ ).

Your program will be tested on input instances that satisfy the following restrictions:

Subtask	Marks	Additional Constraints
1	12	$n = 1$
2	28	$1 \leq n, k \leq 100$
3	21	$k = 1$
4	39	No additional restrictions

## Sample Testcase 1

This testcase is valid for subtasks 2 and 4.

Input	Output
3 3 0 0 0 7 9 2 7 8 9 7 8 2 7 7 7 8 10 9	1

## Sample Testcase 1 Explanation

Benson can only complete module 1, which has knowledge requirement  $[0, 0, 0]$ . After which, he gains 7, 8, 2 knowledge in each of the 3 topics, but  $p = [7, 8, 2]$  is insufficient for him to complete any other module. Since no other sequence allows Benson to complete more than 1 module, the final answer is 1.



## Sample Testcase 2

This testcase is valid for subtasks 2 and 4.

Input	Output
4 3 5 1 0 0 1 5 0 0 0 7 7 7 0 5 6 1 1 1 8 2 0 8 1 4	4

## Sample Testcase 2 Explanation

Benson can complete all 4 modules in the order 3, 1, 2, 4.

With initial knowledge  $p = [0, 0, 0]$ , he can complete module 3 and his knowledge increases by  $u[3] = [8, 2, 0]$ .

With knowledge  $p = [8, 2, 0]$ , he can complete module 1 and his knowledge increases by  $u[1] = [0, 5, 6]$ .

With knowledge  $p = [8, 7, 6]$ , he can complete module 2 and his knowledge increases by  $u[2] = [1, 1, 1]$ .

With knowledge  $p = [9, 8, 7]$ , he can complete module 4 and his knowledge increases by  $u[4] = [8, 1, 4]$ .

Since Benson can complete all 4 modules, the answer is 4.

## Sample Testcase 3

This testcase is valid for subtasks 2 and 4.



Input	Output
5 5 14 11 15 7 15 0 0 0 0 0 9 9 14 2 13 4 3 6 1 0 2 4 7 0 0 5 5 0 0 13 4 4 7 1 0 4 1 0 2 1 2 5 0 2 1 4 0 7 2 12	4

### Sample Testcase 3 Explanation

Benson can only complete 4 modules in the order 2, 4, 5, 3.

With initial knowledge  $p = [0, 0, 0, 0, 0]$ , he can complete module 2 and his knowledge increases by  $u[2] = [4, 4, 7, 1, 0]$ .

With knowledge  $p = [4, 4, 7, 1, 0]$ , he can complete module 4 and his knowledge increases by  $u[4] = [2, 5, 0, 2, 1]$ .

With knowledge  $p = [6, 9, 7, 3, 1]$ , he can complete module 5 and his knowledge increases by  $u[5] = [4, 0, 7, 2, 12]$ .

With knowledge  $p = [10, 9, 14, 5, 13]$ , he can complete module 3 and his knowledge increases by  $u[3] = [4, 1, 0, 2, 1]$ .

With that, he has knowledge  $p = [14, 10, 14, 7, 14]$  which is insufficient to complete any other module. Since no other sequence allows Benson to complete more than 4 modules, the final answer is 4.