

Poor Students

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 512 mebibytes

End of semester is coming, and it is a hard time for students. There are k courses and n students, and every student should pick exactly one course and pass the exam on it.

If student i picks exam j , the student's frustration will be $c_{i,j}$. The total frustration of students is the sum of their individual frustrations.

The teachers insist that, for each exam j , no more than a_j students can pick this exam. What is the minimum possible total frustration the students may get?

Input

The first line contains two integers n and k : the number of students and the number of exams ($1 \leq n \leq 50\,000$, $1 \leq k \leq 10$).

Then follow n lines. In i -th of these lines, there are k integers $c_{i,1}, c_{i,2}, \dots, c_{i,k}$: the frustration of student i if they choose the exam $1, 2, \dots, k$ ($1 \leq c_{i,j} \leq 10^9$).

The last line contains k integers a_1, a_2, \dots, a_k : the maximum number of students that can pick exam $1, 2, \dots, k$ ($0 \leq a_j \leq n$). It is guaranteed that $\sum a_j \geq n$.

Output

Print one integer: the minimum possible total frustration.

Examples

<i>standard input</i>	<i>standard output</i>
6 2 1 2 1 3 1 4 1 5 1 6 1 7 3 4	12
3 3 1 2 3 2 4 6 6 5 4 1 1 1	8