

# Problem M

## Web Delivery

*Gagamboy*, the Philippines' local Spider-Man<sup>3</sup>, has a small issue. He's out of web fluid!

Gagamboy needs 1kg each of  $r$  different chemicals, labeled 1 to  $r$ , in order to synthesize his web fluid. He's too busy fighting crime in Metro Manila to buy these chemicals in person, so he plans to just order them online. The e-commerce app that Gagamboy is using has  $c$  sellers, labeled 1 to  $c$ , who cater to chemistry hobbyists.

All  $r$  chemicals he needs are stocked by all  $c$  sellers, although possibly at different prices. These prices can be encoded in a cost matrix  $A$ , where  $a_{i,j}$  corresponds to the price of 1kg of chemical  $i$  if bought from seller  $j$ .

Also, for each seller, if Gagamboy orders *any* nonzero number of chemicals from that seller, he must also pay a flat *delivery fee* to have a box containing all those chemicals from that seller shipped to his house. The delivery fees are given in a vector  $d$ , where  $d_j$  is the delivery fee if *any* chemicals are bought from seller  $j$ .

Gagamboy wants to emphasize that this is a *flat* delivery fee. Regardless of how many chemicals you ordered from some seller  $j$  (could be one, or two, or all of them, etc.), the delivery fee for that seller will still always be just  $d_j$ .

Given  $A$  and  $d$ , determine the minimum cost for Gagamboy to purchase at least 1kg of each of the  $r$  types of chemicals. There will be  $T$  independent test cases.

### Input Format

The first line of input contains a single integer  $T$ , the number of test cases. The descriptions of the  $T$  test cases follow.

The first line of each test case contains the two space-separated integers  $r$  and  $c$ .

Then,  $r$  lines follow, each containing  $c$  space-separated integers. The value in the  $i$ th line from the top and the  $j$ th column from the left is  $a_{i,j}$ .

Finally, one last line follows, containing the  $c$  space-separated integers  $d_1, d_2, \dots, d_c$ .

### Output Format

Output a line containing a single integer, the minimum possible total cost.

### Constraints

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- $1 \leq T \leq 10$
- $1 \leq r, c$
- $r \times c \leq 250$
- $1 \leq a_{i,j} \leq 10^{15}$  for each  $(i, j)$ .
- $1 \leq d_j \leq 10^{15}$  for each  $j$ .

<sup>3</sup>TL note: *gagamba* is Tagalog for "spider".

## Sample I/O

Input	Output
2	11
3 5	11
1 3 5 7 9	
5 7 9 1 3	
9 1 3 5 7	
4 3 2 3 4	
4 3	
1 2 4	
2 3 1	
4 1 2	
3 2 1	
2 4 4	

## Explanation

In the first test case, here is an optimal solution.

- Buy chemicals 1 and 3 from seller 2. The prices are  $a_{1,2} = 3$  and  $a_{3,2} = 1$ . The delivery fee is  $d_2 = 3$ .
- Buy chemical 2 from seller 4. The price is  $a_{2,4} = 1$ . The delivery fee is  $d_4 = 3$ .

In total, we spent  $((3 + 1) + 3) + ((1) + 3) = 11$ .