Choosing Orders and Renting Machines

Carpenter Sam receives N orders. While reading the orders she realizes that she is missing M machines necessary to complete the orders. Not all orders require all missing machines, but every order requires at least one of them.

To complete an order, Sam needs to either buy or rent each of the machines the order requires. Since different orders need different amounts of work (and thus time) on each machine, the rent for a machine may depend on the order that is completed on it. The purchase cost for a machine do not depend on the orders, though. A machine which is purchased once can be used to work on any number of orders at no extra cost.

If the cost caused by an order seem too high to Sam, she may choose to reject an order; this will lead to no cost (and no profit).

Help Sam decide which orders to reject, which machines to buy, and which machines to rent in order to maximize her profit.

Example

$N = 2$, $M = 3$

Order	Sam's Income if Completed
O_1	100
O_2	100

Machine	Purchase Price
M_1	50
M_2	80
M_3	110

Order	Machine Required by Order	Rent to Complete Order on Machine
O_1	M_1	30
	M_2	20
O_2	M_1	40
	M_3	80

There are two solutions leading to the maximum profit of 50:

- Reject O_2, complete O_1, rent both M_1 and M_2.

- Complete both O_1 and O_2, buy M_1, rent M_2 and M_3.

Input

The first line of the input contains two integers, N ($1 \leq N \leq 1\,200$) and M ($1 \leq M \leq 1\,200$).

The following N blocks of lines each describe an order; they are structured as follows: The first line of block i contains two integers, the income value v_i ($1 \leq v_i \leq 5\,000$) for order O_i and the number of machines m_i ($1 \leq m_i \leq M$) needed for O_i. The following m_i lines each specify a machine j ($1 \leq j \leq M$) needed to complete O_i and the rent r_{ij} ($1 \leq r_{ij} \leq 20\,000$) needed to rent this machine for this order.

The M lines after the last order block contain one integer each: the purchase price s_i ($1 \leq s_i \leq$ 20 000) for each machine.

Output

The output contains exactly one integer: the maximum achievable profit.

Example

Standard input	Standard output
2 3	50
100 2	
1 30	
2 20	
100 2	
1 40	
3 80	
50	
80	
110	