



## PROMOTION

Gigel wants to test his cooking abilities and goes to the market to get some supplies. At the market, there are  $m$  types of objects sold as promotional packages for a period of  $n$  days. On the  $i^{\text{th}}$  day, Gigel has two options: he either buys the promotional package available on that day or not. The promotional package is represented by a non-empty subset of the set of the  $m$  types of objects and it has a certain price.

## TASK

Knowing  $m$ ,  $n$ , the price and the composition of each of the  $n$  promotional packages, find the minimal price that Gigel should pay in order to buy at least one object of each of the  $m$  types.

## INPUT FORMAT

The first line of the input file, *promotion.in*, contains 2 numbers,  $m$  and  $n$ .

The next  $n$  lines will describe the  $n$  promotional packages in this way: the  $(i+1)^{\text{th}}$  line ( $1 \leq i \leq n$ ) contains  $nr$  and  $p$ , which stand for the number of objects in the promotional package from that day and its price. Then, on the same line, there are given  $nr$  numbers which represent the indexes of the objects that belong to that package.

## OUTPUT FORMAT

In the output file, *promotion.out*, print a positive integer number equal to the minimal price that should be paid in order to buy at least one object of every type.

## LIMITS AND CONSTRAINTS

- $1 \leq m \leq 17$ ,  $1 \leq n \leq 1,000$ ,  $1 \leq p \leq 1,000,000$
- All numbers found in the input file are positive integers.
- A promotional package shall be bought only completely.
- The indexes of the objects that describe a certain package have values from the following set:  $\{1, 2, \dots, m\}$ .
- It is guaranteed that there is a solution for all test cases.

## SUBTASKS

Subtask	Score	Additional input constraints
1	50	$m \leq 10$ , $n \leq 100$
2	80	$m \leq 15$ , $n \leq 1.000$
3	100	$m \leq 17$ , $n \leq 1.000$

## EXAMPLE

<i>promotion.in</i>	<i>promotion.out</i>
5 4 3 10 1 3 2	21



**InfO(1) CUP  
NATIONAL ROUND**



2 8 1 4	
3 11 5 4 3	
5 27 1 4 2 3 5	

**EXPLANATIONS**

The chosen packages are the first and the third ones, thus obtaining a minimal cost of  $10+11 = 21$ . Note that Gigel buys one object of type 1, one object of type 2, two objects of type 3, one object of type 4 and one object of type 5.