Smaltimento sostanze tossiche (`smaltimento`)

In order to build his new supercomputer, Luca bought 1 barrel of Olympiadic Acid (OI_2), a very toxic and dangerous chemical, which he now has to dispose of with the minimum possible expense, without harming the environment. He can use various industrial processes that destroy a certain chemical, but can produce other toxic chemicals, which Luca must get rid of as waste.

There are N toxic chemicals, indexed from 0 to $N-1$. There are M industrial processes, indexed from 0 to $M-1$. Process i destroys 1 barrel of chemical A_i, costs 1 euros, and produces K_i barrels of waste chemicals, indexed from 0 to $K_i - 1$. More precisely, waste barrel j of process i contains chemical $B_{i,j}$ (for $0 \leq j < K_i$).

Some processes i do not produce any waste barrel, namely $K_i = 0$, and can therefore be used to dispose of a barrel of chemical A_i for a cost of 1 euro, without producing any waste products.

Initially there is exactly 1 barrel of chemical 0 (Olympiadic Acid), and no other barrel. One can choose which processes to use, how many times, and the order they are used. Find the minimum cost necessary for the disposal of all the barrels.

Implementation

You need to submit a single file, with the extension `.cpp`.

> ☞ Among this task's attachments you will find a template `smaltimento.cpp` with a sample implementation.

You will have to implement the following function:

```
C++ | long long smaltisci(int N, int M, vector<int> A, vector<vector<int>> B);
```

- Integers N and M represent the number of chemicals and industrial processes, respectively.
- Array A, indexed from 0 to $M-1$, contains, at position i, the chemical A_i disposed by process i.
- Bidimensional array B, indexed from 0 to $M-1$, contains the waste chemicals of every process. More precisely, for $0 \leq i < M$, $B[i]$ is an array with size K_i which contains integers $B_{i,0}, \ldots, B_{i,K_i-1}$.
- The function must return the minimum necessary for the disposal of all the barrels. It is guaranteed that there is a strategy which disposes of all the barrels with a cost of at most 10^{15} euros.

The grader will call function `smaltisci` and print the return value on the output file.

Sample grader

Among this task's attachments you will find a simplified version of the grader used during evaluation, which you can use to test your solutions locally. The sample grader reads data from `stdin`, calls the function that you should implement and writes back on `stdout` using the following format.

The input file consists of $M+1$ lines, containing:

- Line 1: Integers N and M.
- Line $2+i$ ($0 \leq i < M$): Integers A_i and K_i, followed by K_i integers $B_{i,0}, \ldots, B_{i,K_i-1}$.

The output file consists of a single line, containing the value returned by function `smaltisci`.

Constraints

- $1 \le N \le 100\,000$.
- $1 \le M \le 200\,000$.
- $0 \le K_i \le 100\,000$ for each $i = 0, \ldots, M-1$.
- The M processes combined have at most 10^7 waste barrels, i.e. $K_0 + K_1 + \cdots + K_{M-1} \le 10^7$.
- Each process produces at most 1 waste barrel for any chemical.
- It's always possible to dispose of all the barrels with a cost of at most 10^{15} euros.

Scoring

Your program will be tested on a number of testcases grouped in subtasks. In order to obtain the score associated to a subtask, you need to correctly solve all the testcases it contains.

- **Subtask 1** [**0 points**]: Sample cases.
- **Subtask 2** [**6 points**]: $N \le 10$ and integers $A_0, A_1, \ldots, A_{M-1}$ are all distinct.
- **Subtask 3** [**5 points**]: $N \le 10$.
- **Subtask 4** [**10 points**]: Integers $A_0, A_1, \ldots, A_{M-1}$ are all distinct.
- **Subtask 5** [**12 points**]: $K_i \le 1$ for each $0 \le i < M$.
- **Subtask 6** [**18 points**]: There is **no** non-empty sequence of processes which can produce a barrel of chemical i starting from a barrel of chemical i, for each $0 \le i < N$.
- **Subtask 7** [**30 points**]: $N \le 10\,000$.
- **Subtask 8** [**19 points**]: No additional constraints.

Examples

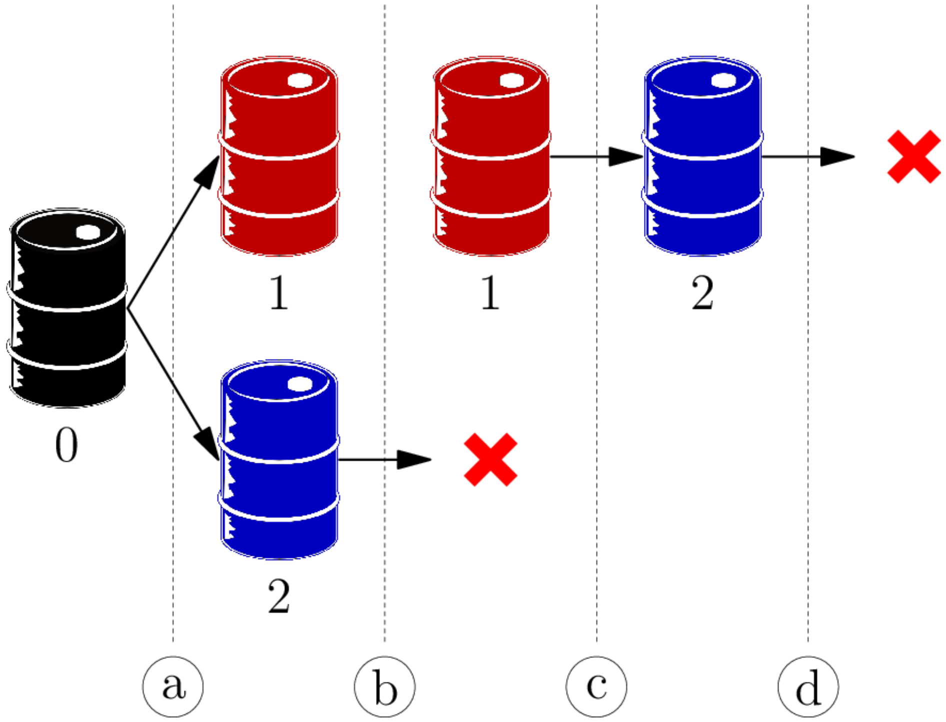
stdin	stdout
3 4 1 1 2 1 2 0 2 0 2 1 2 2 0	4
6 12 0 1 2 0 2 2 4 1 1 4 1 0 2 1 0 2 4 1 3 4 5 3 1 1 4 1 2 4 1 5 5 1 2 5 1 3 5 1 1	10

Explanation

In the **first sample case** it is possible to use the following sequence of processes:

(a) process 2 is used to dispose of a barrel of chemical 0 (the only one initially present), producing a barrel of chemical 1 and a barrel of chemical 2;
(b) process 3 is used to dispose of a barrel of chemical 2, without producing any waste chemical;
(c) process 0 is used to dispose of a barrel of chemical 1, producing a barrel of chemical 2;
(d) process 3 is used again to dispose of a barrel of chemical 2, thereafter all the chemicals have been disposed of.

The cost of this strategy is 4 euros, it's possible to show that there are no better strategies.



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In the **second sample case** one of the possible strategies is the following one:

(a) process 2 is used to dispose of the first barrel, producing one of chemical 2.
(b) process 5 is used to dispose of the barrel of chemical 2, producing a barrel of each of the following chemicals: 1, 3, 4 and 5;
(c) process 3 is used to dispose of the barrel of chemical 1, whithout producing any waste chemical.
(d) process 6 is used to dispose of the barrel of chemical 3, producing a barrel of chemical 1.
(e) process 8 is used to dispose of a barrel of chemical 4, producing a barrel of chemical 5;
(f) process 11 is used twice to dispose of two barrels of chemical 5, producing two barrels of chemical 1.
(g) process 3 is used three times to dispose of three barrels of chemical 1, without producing any waste chemical.

The cost of this strategy is 10 euros.