Problem D - Online University

Description

A new online University has several courses almost ready to open. A course is composed of several classes and a student needs to complete all classes to get the diploma. Each class takes a certain number of days to complete. However, there are some dependencies: a student can only enroll on a certain class if he/she already completed all the required classes.

Note that a student can enroll in as many classes as he/she wants at the same time. Also, once a student has completed all the required classes for a given class, he/she can enroll in that class in the following day.

The online university is almost ready to launch but have asked for your help with two tasks:

- They have noticed that there might exist some inconsistencies in the classes precedences, for instance, in order to complete a class A the student needs to complete a class B (directly or indirectly) and the other way around. In an inconsistent set, every pair of classes in the set is inconsistent and this set has the maximal size, that is, no other classes can be considered for this set without breaking the inconsistent property above. Fix this problem by joining all the classes that are involved in the same inconsistent set into a new class. The number of days to complete this new class is equal to the sum of the number of days required to complete all classes involved in the inconsistent set. Note that there can exist any number of inconsistent sets (or none).
- Once all problematic dependencies are fixed, you need to find the minimum number of days a student will need to complete a course.

Input

The input starts with a single integer denoting the number of test cases (n).

Then, information about the n test cases follow:

- The first line contains two integers separated by a space denoting the number of classes (c) and the number of requirements (r). Classes are numbered from 1 *to* c.
- The second line contains c integers separated by a space denoting the number of days each class takes to complete $d_1, d_2, ..., d_c$.
- Each of the next r lines contains a pair of integers separated by a space denoting the requirements, where the first class in the pair requires the second class to be finished.

Output

For each test case print the minimum number of days it will take to complete all classes.

Constraints

- $n \leq 100$
- $c \leq 800$

Example

Example input:

```
2
6 8
4 1 3 1 2 5
2 1
2 4
2 5
3 2
4 1
4 5
5 3
6 5
5 4
2 4 3 1 8
3 1
4 3
4 2
5 2
```

Example output:

```
16
12
```