

2023 Challenge Puzzle: Software Development

Problem name

Friends and candies

Problem statement

N students are coming home after school. These students are assigned a number from 1 to N . There is a candy shop along the path to home. The i^{th} student wants C_i candies. But the problem is that the shop only has C candies.

A student can only take candy from that shop if the following two conditions are satisfied:

1. The student must be able to take all the candies that he or she wants to take.
2. All his or her friends must be able to take all the candies they want to take.

There are M pairs of friends among the students.

Task

Determine the maximum number of students who can take all the candies they want.

Example

Assumptions

- $N = 4$
- $C = 20$
- $arr = [15, 25, 3, 14]$
- $friends = [[3,4]]$

Approach

- The 1st student wants a total of 15 candies which is fulfilled.
- The 2nd student wants a total of 25 candies which cannot be fulfilled.
- The 3rd and 4th students are friends and wants a total of 17 candies which is fulfilled.

Therefore the maximum number of students who can get candies they wanted is 2.

Function description

Complete the *solve* function provided in the editor. This function takes the following 4 parameters and returns the answer:

- *N*: Represents the number of students
- *C*: Represents the value of candies in the shop
- *arr*: Represents the amount of candy each student wants
- *friends*: Represents the pair of friends array

Input format

Note: This is the input format that you must use to provide custom input (available above the **Compile and Test** button).

- The first line contains two space-separated integers *N* and *C* denoting the number of students and the number of candies in the shop.
- The second line contains *N* space-separated integers where the *i*th integer represents *C_i*.
- The third line contains *M* denoting the number of pairs of friends.
- Each of the next *M* lines contains two space-separated integers *X*, *Y* representing that there is a friendship between students *X* and *Y*.

Output format

Print the answer.

Constraints

$$1 \leq N \leq 10^3$$

$$1 \leq C \leq 10^5$$

$$1 \leq C_i \leq 10^3 \text{ for } 1 \leq i \leq N$$

$$0 \leq M \leq 10^4$$

Code snippets (also called starter code/boilerplate code)

This question has code snippets for C, CPP, Java, and Python.