1 Who is the murderer?

Ashwathdhama, a social activist was brutally murdered by unknown. The news of murder spread like wildfire. The people were blaming the police. The police was under tremendous pressure to nab the culprits and bring them to law.

Based on the clues found at the crime scene, the police arrested a few suspects and strongly believed that one of them is a murderer. All the suspects were interrogated individually but the police could not get any lead or information.

A psychologist suggested all the suspects be housed in a common cell and observe them for a few days. He also said, the murderer would not initiate a talk with others but others will try to talk with him. If many are trying to talk with a single person and if he does not reciprocate then that person could be the potential murderer. So, all suspects were labelled from 1 to N. They were housed in a common cell. A constable was assigned duty to observe and note who spoke with whom.

The constable recorded the information (format explained in *Comments* column below). Given the information recorded by constable, write a program to identify the murderer. If there is no murderer then return **-1**

Input/Output

Input	Output	Comments
4 5 **1 3** **1 4** **2 3** **2 4** **4 3**	**3**	• First line 4 5. **4** corresponds to total number of suspects. **5** corresponds to the total number of instances of talking. • Next five lines corresponds to IDs of **who** initiated talk with **whom**. ○ 1 **3** ○ 1 4 ○ 2 **3** ○ 2 4 ○ 4 **3** • Suspect **3** did not initiate talk with anyone and **all** others initiated talk with him. So, **3** is the potential murderer.
3 3 **1 3** **2 3** **3 1**	**-1**	• 3 total number of suspects. 3 total instances of talking ○ 1 3 ○ 2 3 ○ 3 1 • There is not a single suspect whom everyone else initiated talking with. Also, everyone initiate talk with others. Hence, -1 is the answer.

2 Magic Kingdom Park

Magic Kingdom Park is one of the famous amusement parks in the US. They have many funny games. One of them is "Meet Friend with chocolates". The game goes as follows:

- Two friends (**say A and B**) are supposed to get into a set of closed compartments arranged in **M rows and N columns.**
- Each compartment has a bowl filled either with chocolates or a token in it or an empty bowl (**represented as 0).** The number on the token is always **negative**. The chocolates in the bowl are **positive** numbers.
- Initially, Friend-A is always positioned in the first compartment i.e., (0, 0) and is given some chocolates (C). Friend-B is always positioned in the last compartment i.e., (m, n).
- Now Friend-A must reach Friend-B moving among the compartments from (0, 0) to (m, n).

During this movement, **Friend A** must enter into a compartment then either take the chocolates from bowl (if found) or put chocolates equal to the token number found in the bowl. **Friend-A is supposed to move right and down only**. The game ends if Friend-A is left with no chocolates.

Given the composition of grid, find the minimum number of chocolates that Friend-A needs to reach Friend-B by following the above rules of movement and at least one chocolate remaining.

Input/Output

Input	Output	Comments
3 3 -3 -5 -2 4 5 -6 8 9 -9	4	• First line 3 corresponds to number of rows • Second line 3 corresponds to number of columns • Next three lines corresponds to chocolates in each of the compartment. • Friend-A starts from -3 (0,0) towards Friend-B positioned at -9 (3,3) • One of the possible path to follow would be -3 -> 4 -> 8 -> 9 -> -9 • So, A needs a minimum of 4 chocolates to start his journey from (0, 0) it has -3 chocolates, and follow the path mentioned above to reach B with at least one chocolate.
2 2 1 2 3 -1	1	

3 Regal Tanks

Regal Tanks makes plastic rectangular tanks. All of their tanks are of equal height but different length and breadth.

After manufacturing tanks, they need to transport them to various distributors. In order to cut the costs of transport, smaller tanks are placed inside another bigger tanks i.e., a tank with less length and breadth than another tank can be placed inside it.

Given the dimensions (length and breadth) of various tanks, find out the maximum number of tanks that be placed inside another tanks i.e., a group of tanks. Return **1** if none of the tank(s) can be placed inside any other tank(s).

Input/Output

Input	Output	Comments
5 2 4 3 6 4 5 2 3 1 2	**3**	• First line 5 corresponds to total number of tanks. • Next 5 lines corresponds to the dimensions (length, breadth) of tanks • Tank (1 2) can be placed in Tank (2 3) • Tank (2 3) can be placed in Tank (4 5) • Rest of the tanks cannot be placed in any other tanks. • So, the maximum tanks placed inside each other is **3**
3 5 4 3 6 4 5	**1**	• None of the tanks can be placed in any of the other tanks. They must be transported as it is. Hence, the output is **1.**