Challenge 7 - Yes we scan

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You work for the NSA and your mission is to monitor the two most dangerous terrorists in the world: terrorist A and terrorist B. In order to do this, you must develop a system that monitors phone calls throughout the world. When your system detects that a person calls another person, you mark them as contacts. If your system detects at any given time that terrorist A can reach terrorist B through a list of contacts, it must raise an alarm immediately!

Problem

Given a log of phone calls represented as a pair of integers (where each inte-

ger is the ID of a person), and given the ID of terrorist A and terrorist B, write a program that prints “Connected at <phone_call_index>” where <phone_call_index> is the index of the phone call in the log (starting with 0) at which terrorist A and terrorist B become connected through a list of contacts, or prints “Not connected” if terrorist A and terrorist B are not connected after processing all phone calls.

The phone call log consists of a file with 10^6 lines. Each line is a pair of integers `X` and `Y` separated by one space, representing a phone call between `X` and `Y`, with `0 <= X < 10^9` and `0 <= Y < 10^9`. The phone call log is always the same and can be downloaded here:

- phone_call.log.gz

The terrorist IDs are provided as two integers, one per line, as the problem’s input.

Example 1:

Phone call log (assuming it contains only four phone calls):

```
2 0
1 2
1 4
3 4
```

Input (the IDs of the terrorists):

```
0
4
```

Output:

```
Connected at 2
```

The ID of terrorist A is 0 and the ID of terrorist B is 4, so we have to find phe phone call through which person 0 and person 4 become connected by a list of contacts.

- The first phone call (index 0) is between person 2 and person 0, so 2 and 0 are marked as contacts. 0 and 4 are not yet connected at this point.
- The second phone call (index 1) is between person 1 and person 2, so now person 0 is connected to person 2 directly and to person 1 through person 2, but it is still not connected to person 4.

- The third phone call (index 2) is between 1 and 4, so now there is a connection between 0 and 4 because 0 can reach 4 through 2 and 1 (0 -> 2 -> 1 -> 4). Since the phone call at index 2 is the one that connected terrorist A to terrorist B, we print “Connected at 2”.

Example 2:

Phone call log (assuming it contains only four phone calls):

```
0 3
1 0
2 999999999
1 0
```

Input (the IDs of the terrorists):

```
0
999999999
```

Output:

```
Not connected
```

Since 0 and 999999999 are never connected after processing the four phone calls. Notice that phone calls may be repeated.

Submit & test your code

To test and submit code we provide a set of tools to help you. Download contest tools if you haven't already done that. You will then be able to test your solution to this challenge with the challenge tokens.

```
Challenge tokens: CHALLENGE_7, CHALLENGE_SUBMIT_7
```

To test your program

```
./test_challenge CHALLENGE_7 path/program
```

A nice output will tell you if your program got the right solution or not. You can try as many times as you need.

To test your program against the input provided in the submit phase

```
./test_challenge CHALLENGE_SUBMIT_7 path/program
```

During the submit phase, in some problems, we might give your program harder inputs. As with the test token, a nice output will tell you if your program got the right solution or not. You can try as many times as you need.

In the actual contest you first need to solve the test phase before submitting the code, you must provide the source code used to solve the challenge and you can only submit once (once your solution is submitted you won't be able to amend it to fix issues or make it faster).

If you have any doubts, please check the info section.

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