The Bus Problem

There is a Cultural fest happening in your School. There are N events and the starting and ending times of each events is known . You have to participate in exactly one of these events. Different events may overlap. The duration of different events might be different.

The fest happens in a school. There is a bus 'A' that transports you from your house to the examination centre and another bus 'B' that transports you from the examination centre back to your house.Ignore the transport time of the bus(take it to be 0). But the buses can be used at only certain fixed times, and these are known to you.

So, you use bus A to reach the school, possibly wait for some time before the next event begins, take part in the event, possibly wait for some more time and then use bus B to return back home. If you leave through bus A at time t1 and come back through bus B at time t2, then the total time you have spent is (t2 - t1 + 1). Your aim is to spend as little time as possible overall while ensuring that you take part in one of the events.

You can reach the school exactly at the starting time of the event, if possible. And you can leave the school the very second the event ends, if possible. You can assume that you will always be able to attend at least one event–that is, there will always be an event such that there is bus A before it and bus B after it.

For instance, suppose there are 3 events with (start,end) times (15,21), (5,10), and (7,25), respectively. Suppose the bus A is available at times 4, 14, 25, 2 and the bus B is available at times 13 and 21. In this case, you can leave by the bus A at time 14, take part in the event from time 15 to 21, and then use the bus B at time 21 to get back home. Therefore the time you have spent is (21 - 14 + 1) = 8. You can check that you cannot do better than this.

Input Format

The first line contains 3 space separated integers N, X, and Y, where N is the number of events, X is the number of time instances when bus A can be used and Y is the number of time instances when bus B can be used. The next N lines describe each event. Each of these N lines contains two space separated integers S and E, where S is the starting time of the particular event and E is the ending time of that event, with S < E. The next line contains X space separated integers which are the time instances when the bus A can be used. The next line contains Y space separated integers which are the time instances when the bus B can be used.

Constraints

You may assume that $1 \le N \le 10^5$, $1 \le X \le 10^5$, and $1 \le Y \le 10^5$.

In 30% of the cases, $1 \le N \le 10^3$, $1 \le X \le 10^3$, and $1 \le Y \le 10^3$.

Output Format

Print a single line that contains a single integer, the minimum time needed to be spent to take part in a event.

Sample Input 0

```
3 4 2
15 21
5 10
7 25
```

```
4 14 25 2
13 21
```

Sample Output 0

```
8
```

Contest ends in 7 hours

Submissions: 8
Max Score: 100
Difficulty: Hard

Rate This Challenge:

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C++14

```cpp
#include <cmath>
#include <cstdio>
#include <vector>
#include <iostream>
#include <algorithm>
using namespace std;


int main() {
    /* Enter your code here. Read input from STDIN. Print output to STDOUT */
    return 0;
}
```

Line: 1 Col: 1

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