G - Increase to make it Increasing

Editorial (/contests/abc421/tasks/abc421_g/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 600 points

Problem Statement

You are given a length-N integer sequence $A = (A_1, A_2, \ldots, A_N)$. You are also given M pairs of integers $(L_1, R_1), (L_2, R_2), \ldots, (L_M, R_M)$ $(1 \leq L_i \leq R_i \leq N)$.

You can perform the following operation on sequence A any number of times (possibly zero):

- Choose an integer i with $1 \leq i \leq M$, and add 1 to each of $A_{L_i}, A_{L_i+1}, \ldots, A_{R_i}$.

Determine whether it is possible to make A non-decreasing, and if possible, find the minimum number of operations required.

Constraints

- $1 \leq N \leq 300$
- $1 \leq M \leq 300$
- $1 \leq A_i \leq 300$
- $1 \leq L_i \leq R_i \leq N$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{array}{llll}
N & M & & \\
A_1 & A_2 & \ldots & A_N \\
L_1 & R_1 & & \\
L_2 & R_2 & & \\
\vdots & & & \\
L_M & R_M & &
\end{array}
$$

Output

If it is possible to make A non-decreasing, print the minimum number of operations required. If it is impossible, print `-1`.

Sample Input 1 Copy

Copy

```
4 3
4 2 3 2
2 2
2 3
4 4
```

Sample Output 1 Copy

Copy

```
4
```

For example, by performing operations four times as follows, you can make A non-decreasing:

- Choose $i = 1$ and perform the operation. A becomes $(4, 3, 3, 2)$.
- Choose $i = 3$ and perform the operation. A becomes $(4, 3, 3, 3)$.
- Choose $i = 3$ and perform the operation. A becomes $(4, 3, 3, 4)$.
- Choose $i = 2$ and perform the operation. A becomes $(4, 4, 4, 4)$.

Conversely, it is impossible to make A non-decreasing with three or fewer operations. Thus, print 4.

Sample Input 2 Copy

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Copy

```
3 2
3 1 2
2 2
1 2
```

Sample Output 2 Copy

```
-1
```

No matter how you perform operations, it is impossible to make A non-decreasing.

Sample Input 3 Copy

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

Sample Output 3 Copy

```
0
```

A is already non-decreasing, so no operations are needed.

Sample Input 4 Copy

```
8 12
35 29 36 88 58 15 25 99
5 5
1 6
3 8
8 8
4 8
7 7
5 7
3 3
2 6
1 6
6 7
5 7
```

Sample Output 4 Copy

```
79
```
Copy

'#telegram)

url=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc421%2Ftasks%2Fabc421_g%3Flang%3Den&title=G%20-%20Increasing%20)

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