C - 最短経路/Shortest Path

Time limit : 2sec / Stack limit : 256MB / Memory limit : 256MB

Question

There is a directed graph with V vertices. The vertices are numbered 1 to V. Additionally, for each $i(1 \leq i \leq V-1)$, there is a directed edge of length 1 from vertex i to vertex $i+1$. Process Q queries. For the i_{th} query, a_i and b_i are provided. For this query, execute the following operations.

- Examine if any path exists from vertex a_i to vertex b_i. If any path exists, output the distance of the shortest path from vertex a_i to vertex b_i. If not, output `'-1'`.
- Then, add a directed edge of length 1 from vertex a_i to vertex b_i.

Constrains

- $2 \leq V \leq 100$
- $1 \leq Q \leq 100$
- $1 \leq a_i, b_i \leq V$
- $a_i \neq b_i$

Input

Inputs are provided from standard inputs in the following form.

V Q
a_1 b_1
:
a_Q b_Q

Output

Output Q lines. For line i, output the response for the i_{th} query.

Input Example 1

```
8 8
2 7
2 5
4 1
7 5
1 2
7 5
6 8
1 4
```

Output Example 1

```
5
3
-1
-1
1
1
2
3
```