Krish's Situationships on Stack overflow

HackerRank

`Time Limit: 2 seconds`

`Memory Limit: 256MB`

The *tea* is boiling. Krish *bhaiya*'s love life is officially a stack overflow error. He is currently juggling n **different situationships** at the same time, and the drama is about to crash his entire system.

To prevent a total breakup apocalypse, he has decided to systematize his "reply game." He has to survive m **rounds** of texting. Each of the n situationships has sent him m **specific messages** that he needs to reply to. Each message has a "Drama Score" (an integer).

Krish has n situationships (numbered 1 to n). Each situationship i has a list of m distinct message "Drama Scores." Across all situationships, there are exactly $n \times m$ messages with distinct scores ranging from 0 to $n \cdot m - 1$.

Krish needs to establish a **fixed "Reply Order"** p (a permutation of situationships $1 \dots n$). He will cycle through this exact order m times (once for each round).

The Game Rules:

1. The "Current Drama Level" starts at -1.
2. In each step of the cycle, the current situationship p_i must pick one message from their list to "reply" with.
3. **Constraint:** The message they pick must have a Drama Score **strictly greater** than the "Current Drama Level."
4. Once played, that message's score becomes the *new* "Current Drama Level."
5. This continues until all n situationships have replied m times (emptying their lists).

If at any point a situationship is up next but **cannot** play a message higher than the current level, Krish gets blocked, and the game is lost.

Your Task: Does there exist a permutation p that allows Krish to survive all m rounds? If yes, output the permutation (space-separated). If no, output `-1` (Krish is cooked).

Input Format

- The first line contains an integer t — the number of test cases.
- The first line of each test case contains two integers n and m — the number of situationships and the number of messages each one has.
- The following n lines each contain m integers — the Drama Scores for each situationship.
- **Note:** All $n \cdot m$ scores are guaranteed to be distinct and in the range $[0, n \cdot m - 1]$.

Constraints

- $1 \leq t \leq 1000$
- $1 \leq n, m \leq 1000$
- $1 \leq n \cdot m \leq 10^6$
- The sum of $n \cdot m$ over all test cases won't exceed 10^6.

Output Format

For each test case:

- If a valid order exists, output n integers representing the permutation p.
- Otherwise, output `-1`.

Sample Input 0

```
4
2 3
0 4 2
1 5 3
1 1
0
2 2
1 2
0 3
4 1
1
2
0
3
```

Sample Output 0

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

Explanation 0

Test Case 1:

- $n = 2, m = 3$.
- Sorted cards: $0, 1, 2, 3, 4, 5$.
- Owners:
  - 0 -> Row 1
  - 1 -> Row 2
  - 2 -> Row 1
  - 3 -> Row 2

    - 4 -> Row 1
    - 5 -> Row 2
- The sequence of owners is $1, 2, 1, 2, 1, 2$. This repeats the pattern $1\ 2$ perfectly.
- Output: **1 2**

Test Case 2:

- $n = 1, m = 1$. One card, one owner. Trivial YES.
- Output: **1**

Test Case 3:

- $n = 2, m = 2$.
- Sorted cards: $0, 1, 2, 3$.
- Owners:
    - 0 -> Row 2
    - 1 -> Row 1
    - 2 -> Row 1
    - 3 -> Row 2
- Sequence of owners: $2, 1, 1, 2$.
- For a valid cycle of length $n = 2$, the second half ($1, 2$) should match the first half ($2, 1$). It does not.
- Output: **-1**

Test Case 4:

- $n = 4, m = 1$.
- Sorted cards: $0, 1, 2, 3$.
- Owners:
    - 0 -> Row 3
    - 1 -> Row 1
    - 2 -> Row 2
    - 3 -> Row 4
- Sequence: $3, 1, 2, 4$. Since there is only 1 round, this valid permutation is the answer.
- Output: **3 1 2 4**