THE NATIONAL INSTITUTE OF ENGINEERING

(An Autonomous Institute Under VTU)

DEPARTMENT OF MECHANICAL ENGINEERING

Manandavadi Road, Mysuru-570008, Karnataka, India.

THE ROBOTICS CLUB @ NIE

HACK QUARANTINE 1.1

PROBLEM STATEMENT

Consider you are a controller of a robotic arm in a manufacturing plant. It is your responsibility to look over the working of the robotic arm.

In the manufacturing plant there are ' **K** ' manufacturing units. Each unit outputs ' **N** ' batches (numbered 1 to N) in a day and each batch has ' **M** ' boxes (numbered 1 to M) which are filled with batteries. On regular days you used to program the robotic arm in such a way that it used to pic up all the ' **M** ' boxes one by one and place them on packaging station.

When you arrive in the manufacturing plant today, there is some problem in all the manufacturing units. The problem is that only **ONE** out of 'M ' boxes, in a batch, has batteries in them while other boxes are empty and the pattern is not constant in different batches i.e. the box that contains batteries changes its position in every batch. In hurry the plant manager gives you the details of the position of the box, that contains batteries, in the particular batch of all the units of the manufacturing plant in different sheets, where each sheet represents one of the manufacturing unit out of ' **K** ' units present in the plant. Lets consider that the position of the box with batteries in that particular batch of the respective unit is given by ' **C[i,j]** ' , where j represents the manufacturing unit number and i represents the batch number. The value of C[i,j] varies from 1 to M . You have all the ' **K** ' sheets, but the plant manager did not specify which sheet represents which unit in the plant, you may be told to operate any one of the robotic arm present in the different units.

Now you have to program the robotic arm, in ' **N** ' different batches, in such a way that the worst case (smallest possible) number of boxes with batteries received is maximised.

INPUT

- The first line of the input contains a single integer **' T '** denoting the number of test cases. The description of ' **T** ' test cases is as follows.
- The first line of each test case contains three space-seperated integers **' N ', ' M '** and **' K '**
- **' N '** lines follow. For each **i (1<=i<=N)** , the i-th of these lines contains ' **K** ' space-separated Integers C[i,1], C[i,2], ..., C[i,k].

OUTPT

For each test case, print a single line containing **N** space-separated integers – the positions of the boxes that the robotic arm must pic up for each batch from **1** through **N** . Each of these integers should be between **1** and **M** inclusive.

CONSTRAINTS

- T = 5
- 1 <=N<=500
- 1<=M<=9
- 1<=K<=1000
- 1<=C[i,j]<=M for each valid i,j

EXAMPLE INPUT

1

3 2 2

1 2

2 1

1 1

EXAMPLE OUTPUT

2 1 1

EXPLANATION

If you are placed in the first manufacturing unit then according to your output you will get only one box with batteries i.e. from the third batch, but if you are put on the second unit then you will get three boxes filled with batteries i.e. from first, second and third batch. Since the worst case is that you have only one box filled with batteries your score for this test case will be **1**

RULES

1. The hackathon will start on **15/04/2020 from 10.00 am till 16/04/2020, 10.00 am**.
2. All ideas/codes must be original and developed specifically for the event. Plagiarism will not be entertained.
3. **All the core members of The Robotics Club @ NIE must participate in this Hackathon**.
4. Preferred coding languages- Python or C++.
5. Before submitting the final code you can apply for evaluation of the code, by mailing your code to kunalnaik63@gmail.com . This can be done only 2 times during the given time slots. First slot- **15/04/2020 from 10.00 pm till 15/04/2020, 11.00 pm**. Second slot - **16/04/2020 from 8.00 am till 16/04/2020, 9.00 am**.
6. All your submissions under this event would constitute works for your further existence and role in the Robotics Club @ NIE.
7. You are required to start your model/code development from scratch after the event starts and improve it using the facilities and expertise available.
8. Request you to be mindful and advise to follow safe practices at the Hackathon. The evaluation will be based on the level of innovation, realistic capability and how the given problem statement is addressed.
9. By participating in the Hackathon, you confirm that you have read and agreed to all the rules and regulations stated above.

DISQUALIFICATION

1. Maintain the confidentiality of your ideas. Sharing or predicting ideas will lead to the disqualification of the individual/team.
2. Copyright violations, cheating, recklessness and endangering others, disrespectful behavior, immoral acts, illegal acts during the event are strictly not allowed and will lead to immediate disqualification.
3. Dropping out of the hackathon before the conclusion also leads to the disqualification of the team.
4. Organizers' decision will be final in all such matters.

SUBMISSION

Mail the following documents to *prajwalathreyar@gmail.com* and *kunalnaik63@gmail.com* .

'.pdf' file containing

- The name of the team and the team members.
- Program with comments.
- Explain the task you have carried out regarding how you ended up with these solutions/logic and how it was carried out. Briefly explain them.

IMPORTANT NOTICE !!!

Since social distancing must be followed due to the COVID-19 situation, you are strongly recommended not to meet up in person and work on the problem statement.

Different virtual interaction tools can be used for your convenience.

- *Teamviewer*
- *Zoom* etc. can be used to share your screen amongst your teammates.