Grievous Lady

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

You are given a grid of size $N \times M$. Your task is to color each cell of the grid with one of four colors: 1, 2, 3, or 4.

There is only one rule: any two adjacent cells must have different colors. Two cells are considered adjacent if they share a common edge.

Some cells in the grid may already be colored. These pre-colored cells are located only on the border of the grid. You must color all the remaining empty cells to create a complete grid that satisfies the rule.

Input

The first line of the input contains a single integer T, the number of test cases.

The first line of each test case contains two integers N and M.

The next N lines describe the initial state of the grid. Each line contains M space-separated integers. A value of 0 represents an empty cell, while values from 1 to 4 represent a cell colored with that specific color.

Output

For each test case, output N lines representing the completed grid.

Each line should contain M space-separated integers, where each integer is a color from 1 to 4.

If multiple solutions exist, you may print any one of them.

Scoring

- $1 \leq T \leq 8\,000$
- $5 \leq N, M \leq 2 \cdot 10^5$
- The sum of $N \times M$ over all test cases does not exceed $2 \cdot 10^5$.
- In the initial grid, any non-zero cells are located only on the border (the first or last row, or the first or last column)
- It is guaranteed that a solution always exists for the given input.

Example

standard input	standard output
2 5 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 7 1 0 0 2 0 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4 0 0 0 0 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 3 0 0 2 0 0 1	1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 1 2 1 2 1 2 3 2 1 2 1 2 3 1 1 2 1 2 1 4 2 4 1 2 1 2 1 4 1 2 1 2 1 2 1 2 3 2 1 2 1 2 3 1 3 2 1 2 1