code jam

System.out.println("hello, world!");

Practice Mode

Submissions

Alien Language

10pt	Not attempted **7863/9407 users** correct (84%)
23pt	Not attempted **6938/8239 users** correct (84%)

Watersheds

10pt	Not attempted **5201/5887 users** correct (88%)
23pt	Not attempted **4674/5422 users** correct (86%)

Welcome to Code Jam

10pt	Not attempted **5255/5975 users** correct (88%)
23pt	Not attempted **3029/5339 users** correct (57%)

Top Scores

jaehyunp	99
rem	99
Ying	99
ahmed.aly.tc	99
wcao	99
austrin	99
RalphFurmaniak	99
Jonick	99
elhipercubo	99
ralekseenkov	99

Problem B. Watersheds

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 10 points	Solve B-small
Large input 23 points	Solve B-large

Problem

Geologists sometimes divide an area of land into different regions based on where rainfall flows down to. These regions are called *drainage basins*.

Given an elevation map (a 2-dimensional array of altitudes), label the map such that locations in the same drainage basin have the same label, subject to the following rules.

- From each cell, water flows down to at most one of its 4 neighboring cells.
- For each cell, if none of its 4 neighboring cells has a lower altitude than the current cell's, then the water does not flow, and the current cell is called a *sink*.
- Otherwise, water flows from the current cell to the neighbor with the lowest altitude.
- In case of a tie, water will choose the first direction with the lowest altitude from this list: North, West, East, South.

Every cell that drains directly or indirectly to the same sink is part of the same drainage basin. Each basin is labeled by a unique lower-case letter, in such a way that, when the rows of the map are concatenated from top to bottom, the resulting string is lexicographically smallest. (In particular, the basin of the most North-Western cell is always labeled 'a'.)

Input

The first line of the input file will contain the number of maps, **T**. **T** maps will follow, each starting with two integers on a line -- **H** and **W** -- the height and width of the map, in cells. The next **H** lines will each contain a row of the map, from north to south, each containing **W** integers, from west to east, specifying the altitudes of the cells.

Output

For each test case, output 1+**H** lines. The first line must be of the form

```
Case #X:
```

where **X** is the test case number, starting from 1. The next **H** lines must list the basin labels for each of the cells, in the same order as they appear in the input.

Limits

T ≤ 100;

Small dataset

1 ≤ **H**, **W** ≤ 10;
0 ≤ altitudes < 10.
There will be at most two basins.

Large dataset

1 ≤ **H**, **W** ≤ 100;
0 ≤ altitudes < 10,000.
There will be at most 26 basins.

Sample

Input	Output
5 3 3 9 6 3 5 9 6 3 5 9 1 10 0 1 2 3 4 5 6 7 8 7 2 3 7 6 7 7 6 7 5 5 1 2 3 4 5 2 9 3 9 6 3 3 0 8 7 4 9 8 9 8	Case #1: a b b a a b a a a Case #2: a a a a a a a a a b Case #3: a a a b b b Case #4: a a a a a a a b b a a b b b a a b b b a a a a a a

```
5 6 7 8 9                   Case #5:
2 13                        a b c d e f g h i j k l m
8 8 8 8 8 8 8 8 8 8 8 8 8   n o p q r s t u v w x y z
8 8 8 8 8 8 8 8 8 8 8 8 8
```

Notes

In Case #1, the upper-right and lower-left corners are sinks. Water from the diagonal flows towards the lower-left because of the lower altitude (5 versus 6).