

2022 OFFCUT

At the family firm of *Widget, Whatsit & Doodah* (est. 1862) it has long been a point of pride that very little goes to waste. Indeed, so successful were early endeavours selling the offcuts from the production of knick-knacks that, despite knick-knacks having fallen out of fashion in the late Edwardian era, offcuts are still produced to this day and remain a firm favourite in the firm's gift shops.

Offcuts are now produced directly from rectangular grids, which are subsequently cut down into 2×1 pieces before sale. Each square on the grid contains a single collectable component — so each offcut will contain two (not necessarily distinct) collectables. Each grid contains four of each collectable and, having cut the grid into offcuts, collectables are distributed to two regional distribution centres. Competition between the centres is fierce, so each centre's offcuts contain two of each collectable.

4	4	3	3
4	2	3	2
1	2	1	2
1	3	1	4

For example, consider the sample grid, where the top pair of rows has been cut into vertical offcuts and the bottom pair of rows has been cut into horizontal offcuts. These offcuts can be distributed so that the first regional centre gets the offcuts 4-4, 1-2, 1-3, 3-2 and the second receives 4-2, 1-4, 1-2, 3-3.

SAMPLE INPUT

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

Write a program to determine how to cut the grid into offcuts and how to distribute those offcuts. The first line of input will consist of a pair of integers, r ($1 \leq r \leq 2^{10}$) then c ($1 \leq c \leq 2^{10}$), indicating the size of the grid. The next r lines will each contain c integers, the i^{th} integer on the j^{th} line giving the collectable at (i, j) . Collectables are numbered 1, 2, ... and each will appear exactly 4 times in the input.

SAMPLE OUTPUT

```
1V 6H 7H 4V
2V 8H 5H 3V
```

You should output 2 lines. The first line should contain the offcuts delivered to the first regional distribution centre, and the second line should contain those delivered to the second. Offcuts will be numbered (1, 2, ...) in the order in which they are first encountered in the input. Each offcut in the output should be given by its number followed by a V or an H if it was a vertical or horizontal offcut respectively.

1	2	3	4
5	6		
7	8		