

## Problem 5 - Battleship (battleship)

The goal of this problem is to find the correct solution in a game of battleships by guessing the position of each ship. To find a valid solution you're given clues about the ships' configuration.

Each game is a grid of  $N \times N$  squares. For each row and each column you're given the following information:

- $X$ , a natural number (black in the example), indicates how many squares of that row/column are occupied by ships.
- $Y$ , a natural number (green in the example), indicates how many ships (or parts of ships) appear in that row/column.
- $Z$ , a natural number (red in the example), indicates the longest number of consecutive empty spaces in that row/column.

You also know all ship lengths are between two values  $L_{min}$  and  $L_{max}$  inclusive.

Additional rules:

- A ship must not touch other ships, so two adjacent squares of the grid cannot be occupied by different ships.
- Its possible multiple solutions exist for a given input problem, so any valid solution is acceptable.

			X	X	X	X	X			
		X						X		
			X	X	X	X	X			

Cells arounds a ship that must be empty

### Input data

The first line of the input file contains an integer  $T$ , the number of test cases to solve, followed by  $T$  test cases, numbered from 1 to  $T$ .

Then, for each test case:

- a line with  $N$   $L_{min}$   $L_{max}$ , the width of the square grid and the minimum and maximum length of all the ships.
- a line with  $N$  integers,  $X_{column}$ , the number of occupied squares for each column.

- a line with  $N$  integers,  $Y_{column}$ , the number of ships for each column.
- a line with  $N$  integers,  $Z_{column}$ , max consecutive empty spaces for each column.
- a line with  $N$  integers,  $X_{row}$ , the number of occupied squares for each row.
- a line with  $N$  integers,  $Y_{row}$ , the number of ships for each row.
- a line with  $N$  integers,  $Z_{row}$ , max consecutive empty spaces for each row.

## Output data

For each test case in the input file the output file must contain a line with the characters:

Case # $t$ :

```
X X X ... X X X
X X X ... X X X
...
X X X ... X X X
X X X ... X X X
```

where  $t$  is the test case number (from **1** to **T**) followed by  $N$  lines, each of which contains  $N$  space separated characters indicating 0 for an empty space and 1 for an occupied square.

## Constraints

- $1 \leq T \leq 2$
- $8 \leq N \leq 12$
- $2 \leq L_{min} \leq 3$
- $4 \leq L_{max} \leq 5$
- There is always at least one valid solution for each given test case

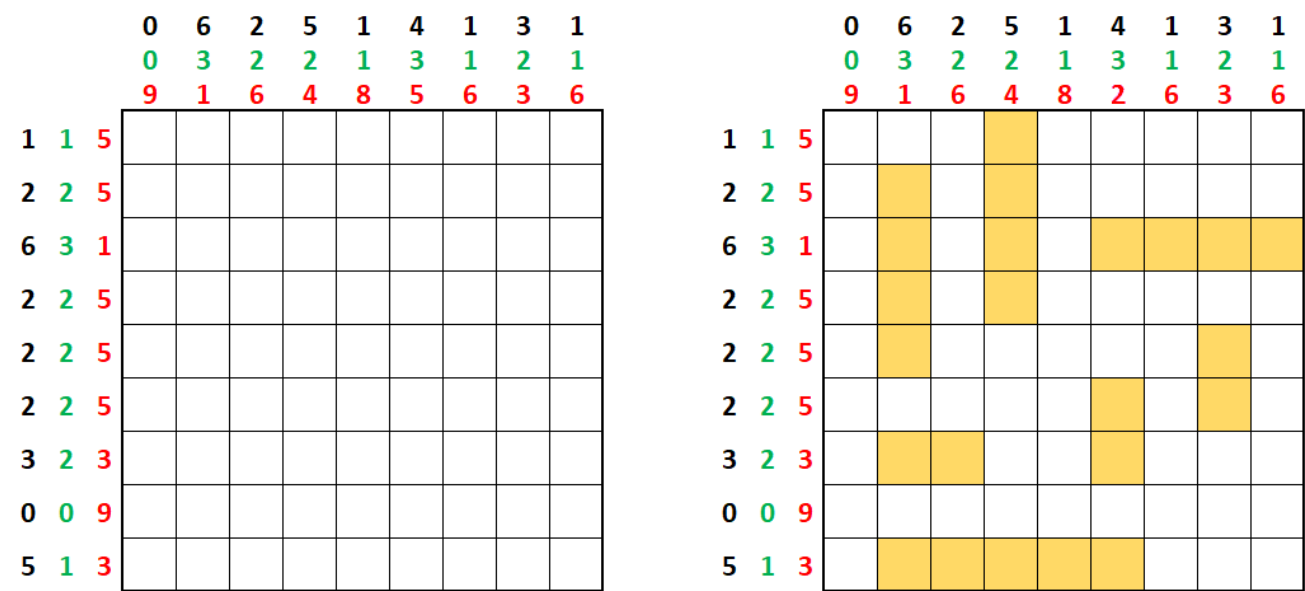
## Scoring

- **input 1** :  $T = 1$  and  $N = 8$
- **input 2** :  $T = 1$  and  $N = 9$
- **input 3** :  $T = 2$  and  $N = 10$
- **input 4** :  $T = 2$  and  $N = 11$
- **input 5** :  $T = 2$  and  $N = 12$

Examples

input	output
1 9 2 5 0 6 2 5 1 4 1 3 1 0 3 2 2 1 3 1 2 1 9 1 6 4 8 2 6 3 6 1 2 6 2 2 2 3 0 5 1 2 3 2 2 2 2 0 1 5 5 1 5 5 5 3 9 3	Case #1: 0 0 0 1 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 1 0 1 0 1 1 1 1 0 1 0 1 0 0 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 1 0 1 0 0 1 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0

Explanation



Example of input (left), and valid solution (right).