

In the 2-player game Battleship, each player takes turns guessing the position of the other player's battleships on a 10 × 10 playing board. When a player correctly guesses a grid that contains a segment of an opponent's battleship, the ship is damaged. If all the segments of a ship have been damaged, the ship is declared to be sunk. You're evaluating an ongoing Battleship game, and have two tables.

The table **locations\_of\_ships** contains the locations of one of the player's ships. This table contains the following columns:

- `id` - the unique ID of the ship;
- `upper_left_x` - the x-coordinate of the upper left corner;
- `upper_left_y` - the y-coordinate of the upper left corner;
- `bottom_right_x` - the x-coordinate of the bottom right corner;
- `bottom_right_y` - the y-coordinate of the bottom right corner.

In this task there can be these types of ships - 1 × 1, 1 × 2, 1 × 3, 1 × 4, 2 × 1, 3 × 1, 4 × 1 , number of ships of particular type is not fixed, but it is guaranteed that they don't overlap.

The target squares of the opponent's shots are given in another table, **opponents\_shots**, which has the following columns:

- `id` - the unique ID of the shot;
- `target_x` - the x-coordinate of the target square;
- `target_y` - the y-coordinate of the target square.

All the coordinates in these tables are 1-based.

The goal is to return a table that describes the current state of the game. For each class of ship (i.e. for each different size), there should be a row containing four integers: a ship's size in the column `size`, the number of undamaged ships of that type in the column `undamaged`, the number of partly damaged ships of that size in the column `partly_damaged`, and the number of ships of that type that have already been sunk in the column `sunk`. The result should be ordered by the size of the ships.

## Example

For given table **locations\_of\_ships**

id	upper_left_x	upper_
1	1	1
2	4	1
3	7	1
4	10	3

and table **opponents\_shots**

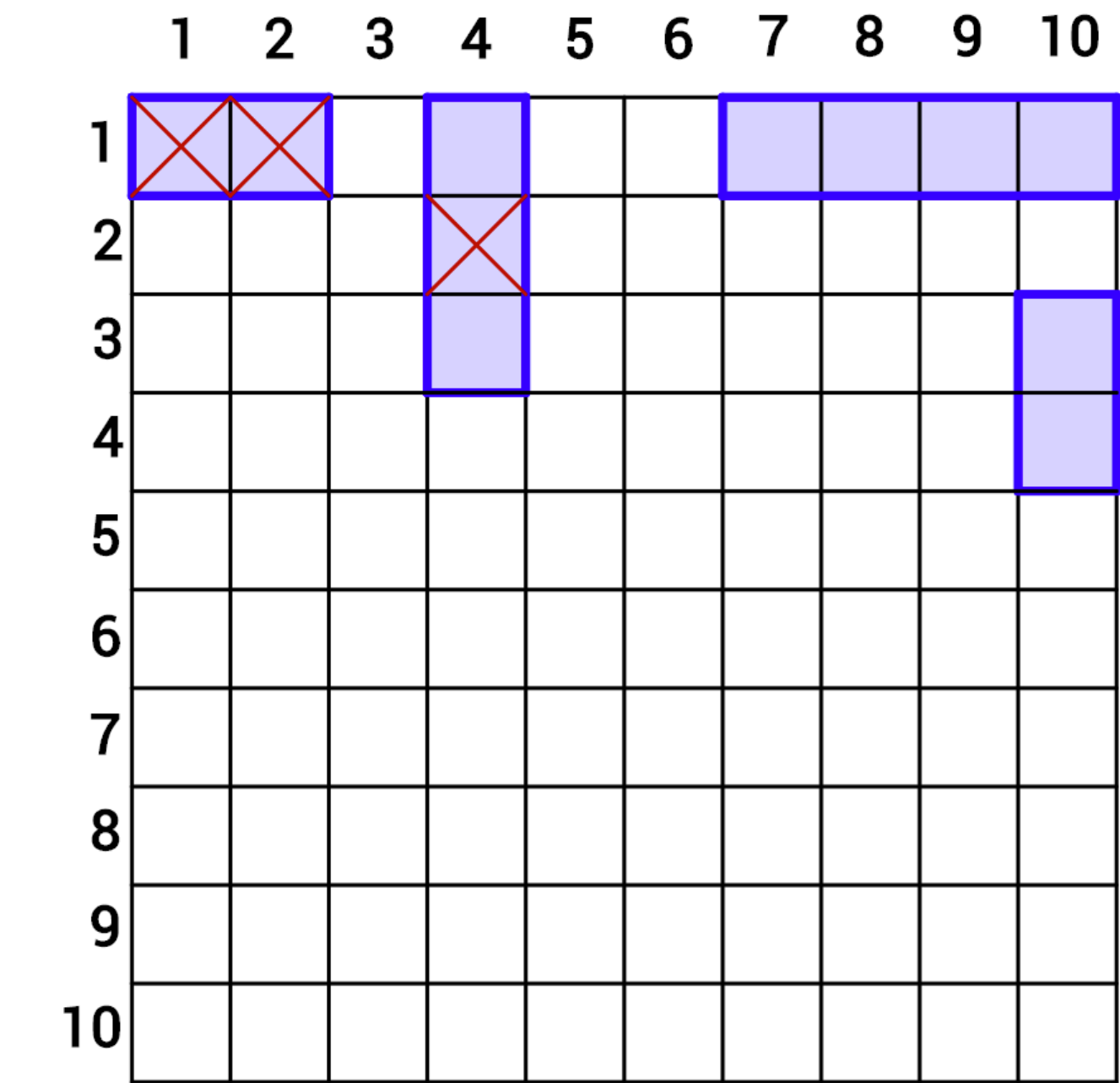
id	target_x	target_y
1	1	1
2	2	1

3	4	2
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the output should be

size	undamaged	partly
2	1	0
3	0	1
4	1	0

The diagram below shows the state of the game board:



- [time limit] 10000ms (mysql)