559 Squares (II)

The game of *Squares* is not well known in our region, but there are some fanatics who spend their whole day playing Squares, using boards as large as they can find. However, recently the *International Squares Federation* decided that the sides of a Squares board may not be larger than 1000 .

Squares is played by two players on a rectangular board, similar to a very big chess board. The fields are numbered from $(1,1)$ at the bottom left corner, to $(1,w)$ at the bottom right corner and (h,w) at the top right corner, where h and w are the height and width of the board. Usually, one of the players decides the size of the board, and the other player makes the first move.

A move consists of choosing a free field. This field is extended to the right and to the top of the board to form a square as large as possible without intersecting already occupied fields. The fields of this new square then belong to the player who made the move, and are no longer free. The game is finished when there are no free fields left. However, it is possible for the players to decide to end the game earlier.

The scoring rules are too complicated to explain here. The number of occupied fields plays a role, but also the moment in the game at which those fields were occupied by the player.

For beginning players, the best strategy is to try to occupy as many fields as possible in each move. More experienced players will sometimes occupy smaller squares for strategic reasons.

Write a program to support beginning players, which, given the size of the board and the moves already made, indicates a field that must be chosen in the next move to occupy a square that is as large as possible.

Input

The input starts with a line which indicates the number of games g to be analysed.

For each game, the input begins with a line with three numbers h, w, and m, separated by a space, where h and w are the height and width of the board $(1 \leq h \leq 1000, 1 \leq w \leq 1000)$, and m is the number of moves already made $(0 \leq m \leq 100)$.

For each move, the input file contains one line with the row and column $(1 \leq r \leq h, 1 \leq c \leq w)$ of the field the player has chosen, separated by a space. The move is legal according to the rules given above, i.e., the field is free.

Output

The output consists of g lines, one line for each game. If there is no legal move possible, the text `game over` should be given. Otherwise, the line should contain three numbers r, c, and s, separated by one space, where r and c are the row and column where a maximal square with side s can be formed. If there is more than one possible solution, the one with the smallest r is given, and if that is not decisive, the one with the smallest c.

Sample Input

```
2
8 8 4
8 1
3 6
1 4
2 1
500 1000 2
1 1
1 501
```

Sample Output

```
5 2 4
game over
```