

Problem F. Maharajas are Going Home

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 512 mebibytes

Jack and Jill have a chessboard which is infinite upwards and to the right. Rows and columns are numbered by integers from 1 to infinity. They play the following game on the chessboard. Initially, there are k stones on the chessboard. During their move, a player takes a single stone and moves it one or more positions to the left, downwards, diagonally (the same number of positions to the left and downwards), or using a knight's move that reduces the row and column numbers (one position downwards and two to the left, or two positions downwards and one to the left). The stone must not leave the chessboard, but may jump over other stones or occupy the same position as other stones. The player who can not make a move loses. Jack and Jill move in turns, Jack moves first.

Help Jack find a winning move, or determine that there exists a winning strategy for Jill.

Input

The first line contains an integer t , the number of test cases ($1 \leq t \leq 100$).

Each test case spans several lines. The first of them contains an integer k : the number of stones in the initial position ($1 \leq k \leq 10$). The next k lines determine the initial positions of the stones, one per line. Each position is given by two integers r and c : the numbers of row and column respectively ($1 \leq r, c \leq 2000$).

Output

For each test case, print a line containing three space-separated integers: i , r , and c . They mean that, when both players play optimally, Jack's winning move is to move i -th stone to position (r, c) . The stones are numbered starting from 1.

If there are several possible solutions, print the lexicographically smallest one: the solution with the minimum number of stone, in case of ambiguity the solution with the minimum row number, in case of ambiguity the solution with the minimum column number.

If Jack does not have a winning strategy, print "-1 -1 -1" (without quotes).

Example

standard input	standard output
3	3 1 1
5	-1 -1 -1
2 3	2 1 1
3 2	
3 3	
3 3	
3 3	
1	
2 4	
2	
1 1	
3 2	