Two Kings

Debby is one of the best chess players in her university. One day, she investigated some variations of chess, and she was able to come up with the following problem:

- You are given 2 white kings on a chess board.
- You have to place the minimum number of black pieces to checkmate both white kings simultaneously.
- In this game, checkmate is a position where is no way to remove the threat from any king. In other words, there is no way to move and remove the threat from at least one king.

She needs your help to find the answer, for a given combination of white kings.

Notes

- The game is played on standard chessboard 8×8.
- We can only use these pieces: *Queen*, *Knight*, *Bishop* and *Rook*.
- For beginners, here are good illustrations for chess-piece moves King, Queen, Bishop, Knight and Rook .
- Piece A *threatens* piece B if piece A can move into B's cell using one move (assuming A and B has different colors).
- If piece A threatens piece B, and piece A is moved into B's cell, then we say that piece B is *captured* and is removed from the board.
- *A king is under threat* if there is a piece of different color which threatens it.
- No piece can jump over another piece (except Knight).

Complete the function checkmate which takes four integers x_1, y_1, x_2, y_2 denoting that (x_1, y_1) and (x_2, y_2) are the coordinates of the two white kings and prints k, the minimum number of black pieces to checkmate both white kings and also a valid placement of k black pieces to checkmate both white kings. Please refer to the sample output for more details.

Here, the (x, y) refers to a cell, with x referring to the row number and y referring to the column number. We number the rows 0 to 7 from top to bottom and the columns 0 to 7 from left to right.

Input Format

The first line contains q, the number of queries. Each query contains four space-separated integers x_1, y_1, x_2, y_2. (x_1, y_1) and (x_2, y_2) denotes the coordinates of the two white kings.

Constraints

- $1 \leq q \leq 50$
- $0 \leq x_1, y_1, x_2, y_2 < 8$

Output Format

For each query:

- Print k in a single line, the number of black pieces.
- Next, print k lines. The i^{th} line must contain t_i, X_i, Y_i separated by single spaces, which means that the i^{th} piece will be of type t_i and will be placed in (X_i, Y_i).

t_i must be one of the following:

- `Q` for Queen.
- `N` for Knight.
- `B` for Bishop.
- `R` for Rook.

Sample Input

```
2
2 1 7 7
0 0 0 7
```

Sample Output

```
3
N 0 0
Q 1 2
Q 7 5
2
R 0 3
R 1 4
```

Explanation