Each of the next n lines has two integers describing a target cell.

Standard output

Output a single integer k ($k \leq 2050$) on the first line, the number of operations your AI needs. Then print k lines, each line is in the format `x y op`. `op` is a single character describing the type of operation performed on cell (x, y):

- `L`, `R`, `U`, `D`: Move the rook currently at cell (x, y) left, right, up, or down.
- `T`: Temporarily remove the rook at cell (x, y).
- `P`: Put the temporarily removed rook back to its recorded position (x, y).

Note that as the chessboard is infinitely large, it is allowed that a rook is moved to a cell with negative coordinates.

If the output sequence contains more than 2050 operations, or any of the operation provided is invalid (e.g. an operation results in two rooks attacking each other; attempting to move a rook at (x, y) but the cell (x, y) is empty; putting a removed rook back to a position different from what was recorded), your solution will receive *Wrong Answer*.

Constraints and notes

- $1 \leq n \leq 10$
- All coordinates of the initial and target cells are between 1 and 99 inclusive.
- No two initial cells share a row or column.
- No two target cells share a row or column.
- At least one target cell is not among the initial cells.
- It can be proved that for any initial and target cells satisfying the given constraints a sequence of no more than 2050 operations exists to solve the puzzle.

Input	Output
2 1 1 2 2 1 2 2 1	6 2 2 T 1 1 R 2 1 R 2 2 P 2 2 L 3 1 L
3 1 2 2 3 3 1 3 2 2 1 1 3	18 2 3 U 1 2 L 2 4 T 3 1 L 2 1 L 2 4 P 0 2 T 1 1 U 1 2 U 0 2 P 1 3 T 0 2 D 2 4 D

Input	Output