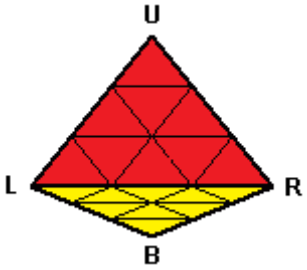
Pyra, Pyra, Pyraminx!

Input file:	`standard input`
Output file:	`standard output`
Time limit:	10 seconds
Memory limit:	512 megabytes

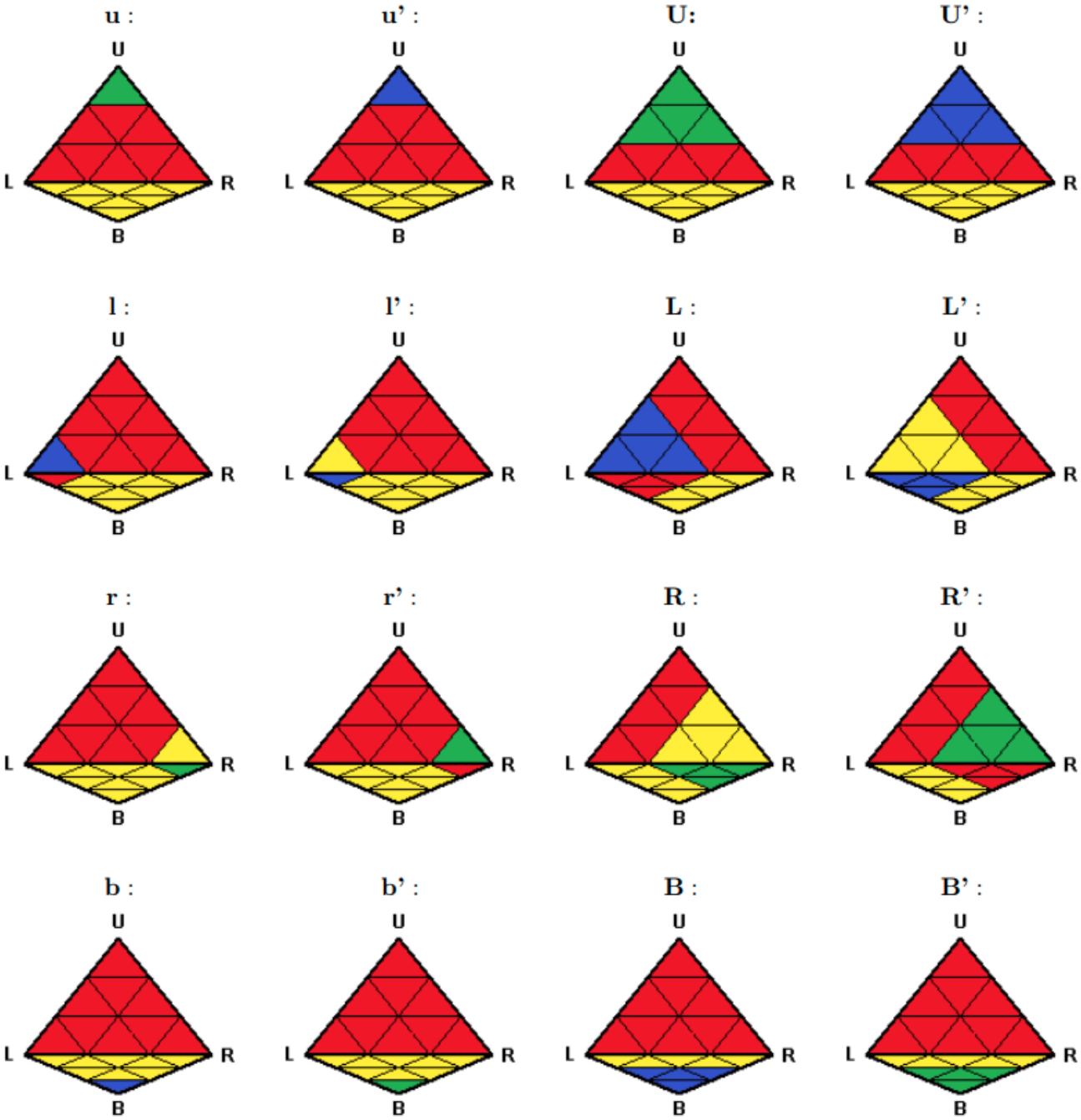
Binic, the speedcuber, has just found a new puzzle that is challenging him: the Pyraminx. This puzzle, contrary to the Rubik's Cube, has the form of a regular tetrahedron (pyramid with triangular base, that has all edges of equal length).



Consider the pyramid as looking directly to a face, then the four tips of the pyramid can be noted with letters **U**(p), **L**(eft), **R**(ight) and **B**(ottom), as in the image to the right. Then, let's say the front face is ULR, the left face is UBL, the right face is URB and the bottom face is BRL.

The pieces of the puzzle can be moved 120° clockwise or counter-clockwise around the axis denoted by a tip of the pyramid and it projection on the opposite face. A rotation of a tip in clockwise direction (when looking straight to that tip) is represented by the lowercase letter of the notation of that tip. A rotation of a tip and the row under it (2 rows of the Pyraminx) in clockwise direction (when looking straight to that tip) is represented by the uppercase letter of the notation of that tip. If an apostrophe (') is added after the letter, the rotation is performed counter-clockwise.

The valid moves for a Pyraminx, starting from the solved state and assuming that the front face is red, the left face is blue, the right face is green, and the bottom face is yellow, are:



Binic is not able to solve this puzzle, but asks you for help. Find a sequence of **at most 100** moves that transforms the Pyraminx in the solved state.

Input

The first line of the input contains a number $1 \leq T \leq 20$, the number of tests.
Each test is described in 12 lines, the first 3 representing the front face (where the upper tip is U), next 3 representing the left face (where the upper tip is U), next 3 representing the right face (where the upper tip is U), and the last 3 representing the bottom face (where the upper tip is B). All faces are described as seen if directly looking at them, knowing that the upper tip is the given one (regarding the inital rotation of the Pyraminx).
The descriptions of each face if formed of 3 lines, containing 1, 3, respectively 5 characters, representing the colours of the triangles on that face (R - red, B - blue, G - green, Y - yellow).
The configurations given as input are always solvable.

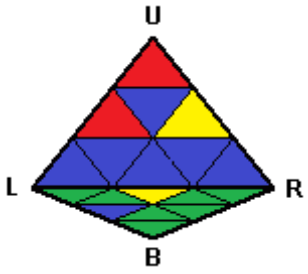
Output

The output should contain the answer for the T tests, for each a sequence of moves that transforms the Pyraminx in the solved state. The sequence of moves is formatted in the following way: on the first line, an integer S, representing the number of moves, followed by S lines, each containing the encoding of a single move.

Example

standard input	standard output
2 R RBY BBBBB Y BRG RRGRR B RYR YYYYY G GGB GGYGG B GBG BBBBB R BRB RRRRR Y RYR YYYYY G GGY GGYGG	14 b R R' U' L b U' L U u L' U L' b 6 U' L U' L U' L

Note



The configuration presented in the example's first test case would look the following, before solving: