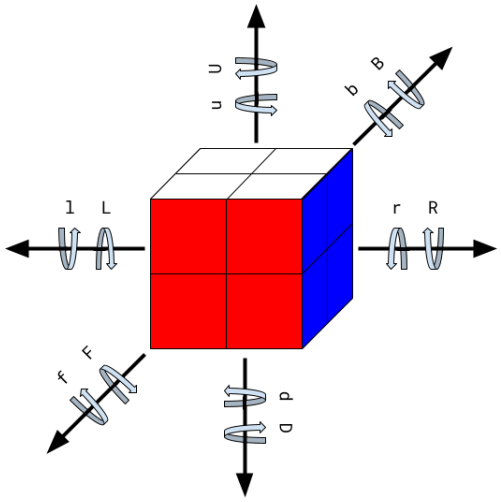
8 Leaves "Turning" Color

Although it has nothing to do with fall, I usually get in the mood to do some Rubik's cubes around this time of year. I don't know, maybe it's the colorful leaves.

Picture the scene, we meet in a park. The morning air is brisk, and the tension palpable. In a flash, I hand you a scrambled 2x2x2 Rubik's cube and an envelope. You open it, and inside is a long string of letters. Below, a hastily scribbled note asks, "Does this sequence of moves solve this cube?" You look up, but I'm already gone.

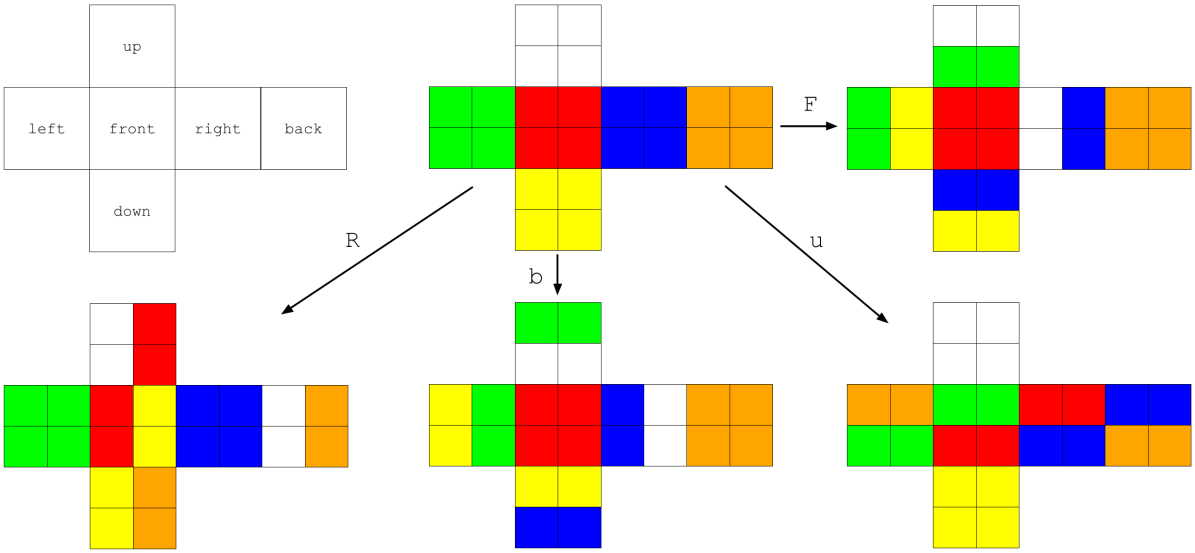
A 2x2x2 cube has 6 sides, each with 4 squares. There are 6 colors in total, and every square is colored one of these 6 colors, with each color being on exactly 4 squares.

There are 12 possible moves, labeled {`F, f, B, b, U, u, D, d, L, l, R, r`}, each corresponding to a rotation of one of the faces: `F/f` are for the front face, `B/b` for back, `R/r` for right, `D/d` for down, etc. Capitalized letters correspond to *clockwise* turns of the face, lowercase letters are for *counter*-clockwise turns. Clockwiseness is decided as if that face was facing you.



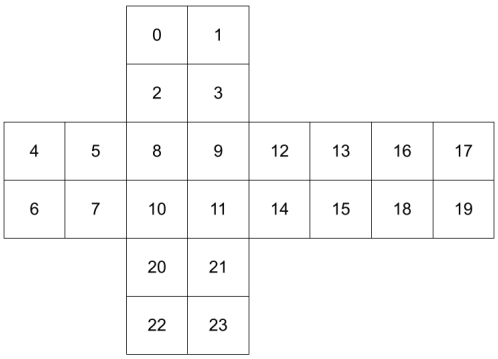
A cube is considered solved if, for every face, all the colors on that face are the same. The orientation of the faces *does not* matter (so, for example, any color can be on the front face, it does not necessarily need to be red).

We can unravel a cube to see all faces at once. The following image shows the unraveled cube (with the faces labeled), an example position (solved, for ease of visualization), and how the cube would look after one of several moves (each starting from the example position).



8.1 Input

The input input will consist of 2 lines. The first line will contain 24 integers, each between 0 and 5, separated by spaces, denoting the colors of each square in the order given below. Each color will appear exactly 4 times. The last line will contain a sequence of letters from the set {`F, f, B, b, U, u, D, d, L, l, R, r`}, with no spaces.



8.2 Output

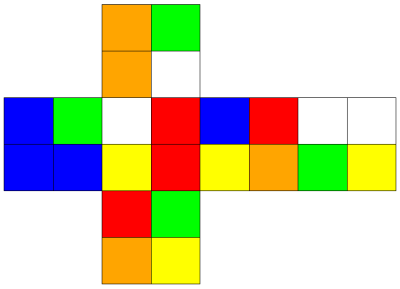
Your output should contain exactly one line. If, after performing the sequence of moves, the cube would be in a solved state then you should output `SOLVED`. Otherwise, you should output `NOT SOLVED`.

8.3 Sample Input/Output

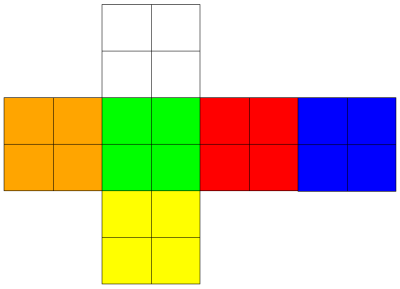
Sample Input	Sample output
`4 1 4 0 3 1 3 3 0 2 5 2 3 2 5 4 0 0 1 5 2 1 4 5` `RRdLffrruuLLFDll`	`SOLVED`

8.3.1 Explanation

The starting position of the cube is (with 0 = white, 1 = green, 2 = red, 3 = blue, 4 = orange, and 5 = yellow):



The sequence of moves produces the state:



which is solved.