

## Rubik's Cube

Input File: rubiks.txt

It has been proven that if you take a solved rubik's cube and apply some formula enough times, it will return back to the solved formation. For example if you turn the right side 90 degrees clockwise and turn the top side 90 degrees clockwise, you will resolve the cube after 105 iterations or 210 turns. Your job is given a formula to determine the smallest number of iterations to return the cube back to normal.

### Input:

The first line contains an integer, N. The following N lines will be a string, each defining a formula. The formulas will be defined using R, R', L, L', F, F', U, and U', with space between each character. These characters represent a turn. R means a 90 degrees rotation clockwise of the right side; R' means a 90 degrees rotation counterclockwise of the right side. L means a 90 degrees rotation clockwise of the left side; L' means a 90 degrees rotation counterclockwise of the left side. The F and U follow the same rules rules of turning clockwise/counterclockwise, except with respect to the Front side and Up (top) side, respectively. Clockwise and counterclockwise are defined by the side in question.

### Output:

You should output the amount of iterations of the given formula it takes to return a Rubik's Cube back to the solved state.

### Example Input:

```
4
R U
R U R' U'
F U F' R L U
R R R R U
```

### Example Output:

```
105
6
105
4
```