Project Euler #244: Sliders

You probably know the game *Fifteen Puzzle*. Here, instead of field 4 by 4 and numbered tiles, we have field N by N, [$\frac{N^2-1}{2}$] red tiles and [$\frac{N^2}{2}$] blue tiles.

A move is denoted by the uppercase initial of the direction (Left, Right, Up, Down) in which the tile is slid, e.g. starting from configuration **(S)**, by the sequence **LULUR** we reach the configuration **(E)**:

For each path, its checksum is calculated by pseudocode:

$$checksum = 0$$

$$checksum = (checksum \times 243 + m_1) \mod 100\,000\,007$$

$$checksum = (checksum \times 243 + m_2) \mod 100\,000\,007$$

...

$$checksum = (checksum \times 243 + m_n) \mod 100\,000\,007$$

where m_k is the ASCII value of the k-th letter in the move sequence and the ASCII values for the moves are:

Letter	Code
L	76
R	82
U	85
D	68

For the sequence **LULUR** given above, the checksum would be 19761398.

Now, starting from given configuration **(S)**, find all shortest ways to reach given configuration **(E)**.

What is the sum of all checksums for the paths having the minimal length?

Input Format

First line contains the only integer N.

Next N lines contain configuration **(S)**.

Next N lines contain configuration **(E)**.

Blue, red and white tiles are denoted by letters **B**, **R** and **W** respectively.

Constraints

- $2 \leq N \leq 4$

Output Format

Print the only number~--- the total sum of all checksums modulo $100\,000\,007$.

Sample Input 0

```
2
WR
BB
RB
BW
```

Sample Output 0

```
18553
```

Sample Input 1

```
3
BBB
BWR
RRR
RBR
BWB
RBR
```

Sample Output 1

```
86665639
```