Snowflake

SEASON 9 – FOURTH ROUND

Alex is making paper snowflakes in the following way:

First he puts a sheet of paper in front of himself. Then he takes one of the edges of the sheet and folds it so that it touches the opposite edge. After making a couple of these folds Alex cuts exactly one corner of the folded paper.

Your task is to find how many holes there will be in the sheet after Alex unfolds it (we call a hole a missing piece of paper, surrounded entirely by paper). **Print the answer modulo 1000000009.**

Input

From the first line of the input file `snowflake.in` N is entered - the number of folds.

On the next line a string of N symbols are entered. Each symbol represents the edge that Alex moving on the corresponding fold with “U” standing for the upper, “D” for the bottom, “L” for the left and “R” for the right.

On the last line two symbols representing the corner that was cut are entered. The first symbol is either “U” or “D” and the second is either “L” or “R”.

Output

In the output file `snowflake.out` print the number of holes modulo 1000000009.

Constraints

$1 \leq N \leq 1\ 000\ 000$

Time limit: 1.0 seconds
Memory limit: 256 MB

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Example

Input (snowflake.in)	Output (snowflake.out)	Explanation
3 RDL DR	1