Tik-tok-toe

SEASON 9 – FOURTH ROUND

Alice and Bob are playing the following game:

Initially there are N boards with 3 rows and 3 columns each and some (possibly 0) of the cells of the boards are filled. Alice plays first. On each turn the current player can fill an empty cell. If at any point there is a row, column or diagonal of filled cells on a board, that board leaves the game. The player that can not make a valid move loses.

Alice and Bob play optimally.

At the beginning each board is set up according to a template, where "#" means filled cell, "." means empty cell and "?" can mean both. Additionally at the beginning there **should be no board that has a filled row, column or diagonal**. Alice loves to win and asks you to find the number of distinct initial configurations in which she would win. As this number can be very large, print it modulo **1000000007**.

Input

From the first line of the input file `ttt.in` N is entered - the number of boards at the beginning of the game.

On the next 3 lines 3 symbols ("`#`", "`.`" or "`?`") are entered - the template of the starting boards. It is guaranteed that there are no 3 "`#`"s in the same row, column or diagonal of the template.

Output

In the output file `ttt.out` print the number of distinct initial configurations in which Alice would win, modulo **1000000007**.

Constraints

$1 \leq N \leq 10^{18}$

Time limit: 0.2 seconds
Memory limit: 256 MB

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Example

Input (ttt.in)	Output (ttt.out)	Explanation
2 ##? ... .?#	2	The valid board configurations, following the template are ##. ... ..# and ##. ... .## If at the beginning the two boards are identical, Bob would win, and if they are different Alice would win.
318820938 #?? .?? ...	53984842	