Challenge: Van der Linde Decoding Challenge

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Difficulty: Hard

Submission Constraints:

- Time limit per test: **0.5 seconds**
- Memory limit per test: **Default (65 MB)**

Description

Dutch and Van der Linde gang have a secret code they use to communicate discreetly, often through messages, especially when one of them is caught.
Unfortunately, Arthur's been caught and jailed, and now you're tasked with helping him decode Dutch's messages, which can contain crucial instructions or information for Arthur.

The Van der Linde Decoding method includes selecting two words from each line of the message **L** and increasing their similarity by adding '!' when needed. The gang has a specific method to measure this similarity, they calculate a score by adding '**x**' value for character matches, '**y**' value for mismatches, and '**z**' values for '!' insertions. After obtaining these scores, they convert each numerical score into a character using a predefined dictionary for translation named **Translate.** For instance, if the dictionary contains 2 lines: **16:A** on the first line, and **5:.** on the second line, this indicates that the number **-16** corresponds to '**A**' and **5** to '.' and any other numbers do not have corresponding values.

Consider the example of comparing the words "ARTHURT" and "AHURT" to understand how similarity scoring works in this context. let's say The gang agreed that the method to calculate the similarity score is to add 1 when characters match, -1 when they don't, and -2 when '!' is added. The following table demonstrates the optimal places to insert "!" to increase the similarity between the two words :

A	!	!	H	U	R	T
A	R	T	H	U	R	R

Score= 1 +   (-2)   +   (-2)   + 1   + 1   + 1   - 1 = -1

Inputs

- The first line contains the number n–the length of the message L
- The second line contains the number m–the length of the dictionary translation table
- The next n lines contain the message. Each message line has 2 words
- The next m lines describe the translation table. Each line has a key-value pair separated by a colon ':'
- The last 3 lines contain the metrics to measure the similarity score:
    - The first line designates the value x
    - The second line designates the value y
    - The third line designates the value z

Outputs

One line, the Real message.

Examples

Input	Output
5 4 ARTHURT AHURT DEAR DEAO TIHITI TIHIT Plaaaan Ploaaan HAVEPLAAAAAANNA HAVEPLOAAAAANN 1 :H 2 :I	HIDE

3 :D 10:E 1 -1 -2	
11 8 ABCDEF FEDCBA DEAR ARTHUR EAT WELL EVERYONE ALL MISS YOUARTH MIKE MIKA DEAR DARE SETIN SETING EATINGO EATINGOA ARTHURTTTT ARTHURTTTT AB ACB -5 :O -7 :W 2 :A -5:A 4:Y -4:L -8:. -2:D 1 -1 -1	OLD.WAY