

Score table

There are some hockey teams participating in a tournament. The tournament consists of a set of matches. In each match participate two teams.

The total score between two teams, say team X and team Y, is a pair of integers (GX, GY) presented in format GX:GY.

The value of GX is the total number of goals which team X scored against team Y in the whole tournament.

The value of GY is the total number of goals which team Y scored against team X in the whole tournament.

The list of matches in the tournament has a special structure. It is a list of text lines, each line describes at most one match.

A line describes one match if and only if it contains exactly two team names and exactly one correct score.

Otherwise, the line does not describe a match.

A correct score is a string in format A:B which contains no spaces and where A and B are integer numbers from interval [0, 20].

The first team in the line which describes a match is the team who scored A goals and second team in the same line is the team who scored B goals.

Both team names and a correct score must not be a part of a longer string which does not contain spaces.

Also, team names and a correct score cannot contain any additional characters.

For example, "E11:5", "4::1" are not correct scores. For example, when "ABC" is a team name, strings "ABCa", "AB6C", "t:ABCx" are not team names.

The task

You are given a list of team names and a list of matches between the teams. Calculate and print the total score between all pairs of teams in a table form.

Input

The first input line contains a list of team names, the names are separated by spaces. All names are unique. Each team name is a string of length at most 7 and it contains no spaces. The number of teams is denoted by N.

The second input line contains one integer L , the number of following lines in the input. Next, a list of L lines follows, each line consists of one or more words. A word is a substring of the line which does not contain spaces and it is separated from other words by spaces.

Characters in the input lines are small and capital letters of English alphabet, ('abcd...xyz', 'ABCD...XYZ'), digits ('1234567890') and colon. Each line contains at least 2 and at most 120 words, separated by spaces, each word length is at most 100 characters.

It holds, $2 \leq L \leq 1000$. There are at most 100 teams in the input.

Output

The output is an $(N+1) \times (N+1)$ table of cells. Each row of the table occupies one output line. Each cell occupies exactly 8 output columns. There is no space and no additional symbol between any two neighbour cells in the table. The first table row contains at positions (0, 1), (0, 2), ..., (0, N) the list of all teams names sorted alphabetically, each team name occupies one cell. The first table column contains at positions (1, 0), (2, 0), ..., (N, 0) the list of all teams names sorted alphabetically, each team name occupies one cell.

Let Tr and Tc be the names of the teams printed in row r and column c , respectively. The cell at position (r, c) contains the total score between teams Tr and Tc . The text in each cell is aligned (justified) to the right. All cells

on the table diagonal are empty, they are printed as spaces. When there was no match between two teams their total score is considered to be 0:0.

Example 1

Input

Foxes Birds Tigers
7
That day the score between Foxes and Tigers was 3:4
Anyway Birds defeated Foxes as much as 10:5
On Monday 6th neither Birds neither Tigers won anything
3:1 was the result of Tigers vs Foxes Match
Go Birds and win at least 7:2 when Tigers appear
All Foxes Birds and Tigers have just 2 days to complete training
Birds 11:11 Foxes

Output

	Birds	Foxes	Tigers
Birds		21:16	7:2
Foxes	16:21		4:7
Tigers	2:7	7:4	

Example 2

Input

A B C D
12
A B 1:2
A C 1:3
A D 1:4
B C 1:5
B D 1:6
C D 1:7
A B 1:2
A C 0:0
A D 0:0
B C 0:0
B D 10:10
C D 10:10

Output

	A	B	C	D
A		2:4	1:3	1:4
B	4:2		1:5	11:16
C	3:1	5:1		11:17
D	4:1	16:11	17:11	

Example 3

Input

MIT CTU ETH Oxford UCLA
11
No game between CTU and UCLA which would end in 2:4 score
Oxford beat UCLA 2:1
UCLA beats MIT 6:4
5:2 cannot happen between ETH and CTU

Who bets 2:2 in match of CTU and MIT
Always 0:0 when ETH and Oxford clash
MIT loses 1:11 and UCLA does as well
No chance for ETH against CTU maybe 2:5
Try 1:1 when Oxford checks ETH
Garbage guaranteed :gua ::ranteed :12: Pfff blub::: x
Some more mess ::23:2a4jf g23:6ha7 and 2:3 MIT brr:r UCLA g:ajaj

Output

	CTU	ETH	MIT	Oxford	UCLA
CTU		7:7	2:2	0:0	2:4
ETH	7:7		0:0	1:1	0:0
MIT	2:2	0:0		0:0	7:20
Oxford	0:0	1:1	0:0		2:1
UCLA	4:2	0:0	20:7	1:2	
