7939 Employee Voice Surveys

Employee voice surveys in corporates are generally touted to be anonymous, but only a fool can ignore the elephant in a room. Some such foolish employees filled the surveys with swear words.

Company maintains its list of words that it considers as against their employee disciplinary policy (EDP), these words are often said to be NDW (Non Disciplinary Words). There is a limit on patience limit for bearing swearing by each employee by the company. This limit depends on the position of the employee, race, sex and what not, but seldom on the quality of the work produced by the employee.

So, the HR (Human resources) department scans through each word in the swear words list of the employees, and find whether there is some word in NDW which has this word as its prefix. If such a match is found, then this swear word will be counted as an offense against the EDP. For example, if employee swear word was "shit", and the NDW list contains "shitty", then this will be counted as an offense against the EDP. In other words, for each of the words spoken by the employee, they find the number of words in the NDW list whose prefix that word is, and the offense count of the employee will be increased by that number. When the number of such offenses reach the patience limit for the employee, they immediately start typing the formal polite mail to suggest the employee to find another job. You have to find after which slang in the list they will start typing the mail.

As you know that our society is changing very fast, so swear words of previous year might not be considered swear words any more, in fact, they usually are considered cool words. So, NDW list is not fixed and can change over time. So, given a feedback of a employee, you have to find the at which slang the employee will be fired for each of the NDW list. Note that the patience limit for the employee can change over the NDW lists. Some employees are smart, so they might not be using slangs and can release their frustration over alcohol, thus they can not be fired, output '`-1`' for such smart people.

Input

The first line contains an integer N denoting the number of swear words.

The second line contains the N strings corresponding to the list of swear words.

The next line contains an integer Q denoting the number of queries, i.e. the number of NDW lists.

Each query is represented by two lines.

The first line contains two integers S and TH denoting the number of words in NDW list, and the patience limit/threshold for an employee for this NDW list respectively.

The second line contains the S strings denoting the list of words in NDW list.

Output

For each query, output a single integer in a new line, the answer to the given problem.

If the employee will be let go, you should output an integer denoting after which swear word, the employee will be fired. Output the position of the word in 1-based indexing. If the employee will never be fired, output '`-1`' instead.

Constraints:

- $1 \leq N, S \leq 100,000$
- $1 \leq TH \leq 1,000,000,000$
- $1 \leq$ *sum of lengths of all strings* $\leq 1,000,000$

Explanation

Query 1: HR scans through the employee swear words list pirate, crook, syco, vampire, the offense for word "pirate" will be counted as 1 (as it is a prefix of pirated). Offense for the word "crook" is zero. For word syco, it will be 2 (as it is a prefix of sycophant and syconess). For word "vampire" it will be one. The HR will scan through the first three words, then the offense of the employee will reach the limit of 3, and thus the HR will fire him/her. So, the answer will be 3.

Query 2: NDW list is similar to previous one, but patience limit is higher, this time, the HR will fire the employee at the word 4 in the feedback.

Query 3: NDW list is similar to previous one, but as the patience limit is very high, this employee won't be fired at all. So answer is '`-1`'.

Query 4: Offense of employee after scanning the entire list is 3, which does not go beyond or equal to patience limit of 4. So, he/she won't be fired.

Query 5: At the second word "crook" itself, the employee will be fired, as patience limit of 1 is reached.

Sample Input

```
4
pirate crook syco vampire
5
7 3
monopolizers pirated phony sycophant syconess piracy vampires
7 4
monopolizers pirated phony sycophant syconess piracy vampires
7 5
monopolizers pirated phony sycophant syconess piracy vampires
3 4
crook crookedness vampire
1 1
crooked
```

Sample Output

```
3
4
-1
-1
2
```