D Anti-Rhyme Pairs

Input: Standard Input
Output: Standard Output

Often two words that rhyme also end in the same sequence of characters. We use this property to define the concept of an anti-rhyme. An anti-rhyme is a pair of words that have a similar beginning. The degree of anti-rhyme of a pair of words is further defined to be the length of the longest string **S** such that both strings start with **S**. Thus, “arboreal” and “arcturus” are an anti-rhyme pair of degree 2, while “chalkboard” and “overboard” are an anti-rhyme pair of degree 0.

You are given a list of words. Your task is, given a list of queries in the form **(i, j)**, print the degree of anti-rhyme for the pair of strings formed by the **i**-th and the **j**-th words from the list.

Input

Input consists of a number of test cases. The first line of input contains the number of test cases **T ($T \leq 35$)**. Immediately following this line are **T** cases.

Each case starts with the number of strings **N ($1 \leq N \leq 10^5$)** on a line by itself. The following **N** lines each contain a single non-empty string made up entirely of lower case English characters ('a' to 'z'), whose length **L** is guaranteed to be less than or equal to **10,000**. In every case it is guaranteed that **$N*L \leq 10^6$**.

The line following the last string contains a single integer **Q ($1 \leq Q \leq 10^6$)**, the number of queries. Each of the **Q** lines following contain a query made up of two integers **i** and **j** separated by whitespace **($1 \leq i, j \leq N$)**.

Output

The output consists of **T** cases, each starting with a single line with **“Case X:”**, where **X** indicates the **X**-th case. There should be exactly **Q** lines after that for each case. Each of those **Q** lines should contain an integer that is the answer to the corresponding query in the input.

Sample Input

```
2
5
daffodilpacm
daffodiliupc
distancevector
distancefinder
distinctsubsequence
4
1 2
1 5
3 4
4 5
2
acm
icpc
2
1 2
2 2
```

Output for Sample Input

```
Case 1:
8
1
8
4
Case 2:
0
4
```

Warning: I/O files is huge, make sure your I/O is fast.