12338   Anti-Rhyme Pairs

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
```

Sample Output

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