Some time ago, Dejan Stojanovic, a Serbian poet, said: “Words rich in meaning can be cheap in sound effects.” Is it true? A String Processing professor at UFPE wants to test this quote with strings. For that, he defined what he calls a “cheap B-subsequence”. A cheap B-subsequence, according to his definition, is a subsequence of size B, of a string S ($B \leq |S|$), that has the lowest associated cost. To define the cost of a string, the professor determined a series of rules to each letter of the alphabet. The alphabet that he used contains only lowercase letters. The rule of a letter is defined as a set of pairs (P_i, C_i), which indicates that if this letter appears in a position X on the subsequence, where X is a multiple of P_i, then the cost of $(X/P_i) * C_i$ will be added to the total cost of this subsequence. Let’s show an example. Suppose we have the following rules:

$$\begin{aligned}
\texttt{[a]} &= \{(2,3),(4,10)\} \\
\texttt{[b]} &= \{(1,4),(7,50)\} \\
\texttt{[c]} &= \{(1,2),(4,20)\} \\
\texttt{[d..z]} &= \{\ \}\ \text{// there are no rules for the characters `d' to `z'}
\end{aligned}$$

Suppose we have the string ‘abaabcbc’, and $B = 4$. If we choose the subsequence ‘`aabc`’ (abaabcbc), we would do the following procedure to calculate the associated cost:

1. The first letter of the sequence is an ‘`a`’, and the position 1 is neither multiple of 2 or 4, so the cost is 0;
2. The second letter of the sequence is another ‘`a`’, and the position 2 is a multiple of 2, so we’ll add the cost of $(\frac{2}{2}) * 3 = 3$;
3. The third letter of the sequence is a ‘`b`’, and the position 3 is multiple of 1, so we will add the cost of $(\frac{3}{1}) * 4 = 12$;
4. The last letter of the sequence is a ‘`c`’, and the position 4 is a multiple of 1 and 4, so we will add the cost of $(\frac{4}{1}) * 2 + (\frac{4}{4}) * 20 = 28$.

The total associated cost to this subsequence is 43, which is not the lowest cost, since we could have chosen `aaab` (abaabcbc) and obtained an associated cost of 19 — this is indeed the cost of the cheap B-subsequence. Given the string S and the integer B, and the rules of the alphabet, your task is to create a program that tells the professor the cost of the cheap B-subsequence.

Input

The first line contains T ($T \leq 100$) — the number of test cases, after this line T test cases follows. The first line of a test case contains a string S of lowercase letters and an integer B ($1 \leq B \leq |S| \leq 100$). Each of the next 26 lines describe the rule of each letter. The first of the 26 lines corresponds to the rule of the letter ‘`a`’; the following line corresponds to the rule of the letter ‘`b`’; the last of the 26 lines corresponds to the rule of the letter ‘`z`’. Each line containing a rule is described in the following way: $Q\ P_1\ C_1\ P_2\ C_2 \ldots P_Q\ C_Q$ ($1 \leq Q \leq 10$; $1 \leq P_i \leq |S|$; $1 \leq C_i \leq 50$), where Q is the amount of pairs associated to this rule, and is followed by the pairs themselves.

Output

For each test case print a line containing ‘`Case #`X`:` Y’, where X is the case number, starting at 1, and Y is the cost of the cheap B-subsequence.

Sample Input

```
2
abcd 1
1 1 20
1 1 15
1 1 8
1 1 30
1 1 2
0 (21 lines)
abaabcbc 4
2 2 3 4 10
2 1 4 7 50
2 1 2 4 20
0 (23 lines)
```

Sample Output

```
Case #1: 8
Case #2: 19
```