

Problem B

Another Word Game

Input: Standard Input
Output: Standard Output

This is just another word game. You are given a dictionary of words. Each of the word has a weight **W**, which is an integer value. You are given another string **S**. Initially your score is zero. In each turn you can mark some consecutive characters. If these consecutive characters create a word in the given dictionary, corresponding weight will be added to your score, otherwise a penalty **P** will be subtracted word length times from your score. Here word length is number of character in a word, and **P** is an integer value. What is the maximum score you can gain?

Note that your have to make a move until all characters of S are marked, and you cannot mark one character more than once.

Input

Input will start with an integer number **T** ($T \leq 20$), which indicates the number of test case. Each test case starts with two integer **N** ($N \leq 10000$) and **P** ($0 \leq P \leq 10000$). Here **N** is the number of words in the dictionary and **P** is the value of Penalty. Each of the next **N** lines will contain a word and corresponding integer weight **W**. No word of this dictionary will contain more than 100 characters, and a word will only contain lower case alphabet ('a', 'b', ... 'z'). The last line of the input will contain string **S**. S will not contain more than **10000** characters, and will contain only lower case letters.

Output

For each test case you have to output one line which "Case #:" where # is replaced by the case number, then a space, then the maximum score.

Sample Input

```
3
2 5
ab 2
cd 3
abcd
3 5
ab 2
cd 3
bc 16
abcd
1 100
abd 1
abcd
```

Output for Sample Input

```
Case 1: 5
Case 2: 6
Case 3: -400
```

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