

## 11539 Another Word Game

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  $W$  ( $0 \leq W \leq 10000$ ). 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
```

### Sample Output

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