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Substring

Input: Standard Input
Output: Standard Output

Given a set of pattern strings, and a text, you have to find, if any of the pattern is a substring of the text. If any of the pattern string can be found in text, then print “yes”, otherwise “no” (without quotes). But, unfortunately, that’s not what is asked here. ☺

The problem described above, requires a input file generator. The generator generates a text of length L , by choosing L characters randomly. Probability of choosing each character is given as priori, and independent of choosing others.

Now, given a set of patterns, calculate the probability of a valid program generating “no”.

Input

First line contains an integer T , the number of test cases. Each case starts with an integer K , the number of pattern strings. Next K lines each contain a pattern string, followed by an integer N , number of valid characters. Next N lines each contain a character and the probability of selecting that character, p_i . Next an integer L , the length of the string generated. The generated text can consist of only the valid characters, given above.

There will be a blank line after each test case.

Output

For each test case, output the number of test case, and the probability of getting a “no”.

Constraints

- $T \leq 50$
- $K \leq 20$
- Length of each pattern string is between 1 and 20
- Each pattern string consists of only alphanumeric characters ('a' to 'z', 'A' to 'Z', '0' to '9')
- Valid characters are all alphanumeric characters
- $\sum p_i = 1$
- $L \leq 100$

Sample Input

```
2
1
a
2
a 0.5
b 0.5
2

2
ab
```

Output for Sample Input

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Case #1: 0.250000
Case #2: 0.840000
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<pre>ab 2 a 0.2 b 0.8 2</pre>	
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