K. Zayin and String

Zayin likes chatting online with his girlfriend and he has compiled a dictionary of love words. The dictionary contains m words named $w_1, w_2, \ldots, w_m$, each of which has its own love value $v_1, v_2, \ldots, v_m$.

All words are strings consisting of only lowercase English letters. And the love value of any word that isn't in the dictionary is 0.

By using this dictionary, Zayin can define the sweetness of a string S.

$$sweetness(S) = \frac{\sum_{l=1}^{|S|} \sum_{r=l}^{|S|} love(S(l,r))}{|S|}$$

Where $S(l,r)$ means the substring of S which starts with l-th character and ends with r-th character (both inclusive) of S, $|S|$ means the length of string S, and $love(s)$ means the love value of string s, as defined above.

This means the sweetness of a string S is the sum of love value of all its substring devided by the length of S.

Now Zayin's girlfriend has sent Zayin a message consisting of a string S and asks Zayin a question, what is the maximum sweetness of all subsequences of S? A subsequence of S is a string that can be derived from string S by deleting some or no elements without changing the order of the remaining elements.

When Zayin is dating with his girlfriend, his IQ drops from 301 to 31. So he asks you to help him solve the problem.

Input

The first line of input contains an integer $T(T \leq 80)$, indicating the number of cases.

For each case, the first line consists of two numbers $n(1 \leq n \leq 1000), m(1 \leq m \leq 1000)$, the length of string S and the size of dictionary. The second line is a string S followed by m lines, each line contains a string w_i and an integer v_i.

We guarantee that for each case, $n, m < 1000, \sum |w_i| \leq 4000, 0 \leq v_i \leq 10^5$ and w_i are pairwise different.

For each input file, $\sum n \leq 3000, \sum m < 2000, \sum |w_i| \leq 10000$.

All strings consist of only lowercase English letters.

Output

For each test case, you need to output the maximum sweetness of all subsequences. In order to avoid output floating point number, you need to output the answer modulus 998244353. If the answer is $\frac{A}{B}$, you need to output the value of $A \times B^{-1} \mod 998244353$.

Sample

Input	Output
3 17 3 woyaoakccpcxiamen ak 5 ccpc 6 xiamen 8 33 3 niweishenmezhengtianxunlianbuliwo wo 3 se 1 zayin 7 39 2 programmingcontestandmewhichisimportant me 11 gg 2	499122179 499122178 499122182

Hint

For test case 1, the subsequence with maximum sweetness is “ak”;

For test case 2, the subsequence with maximum sweetness is “wo”;

For test case 3, the subsequence with maximum sweetness is “me”.