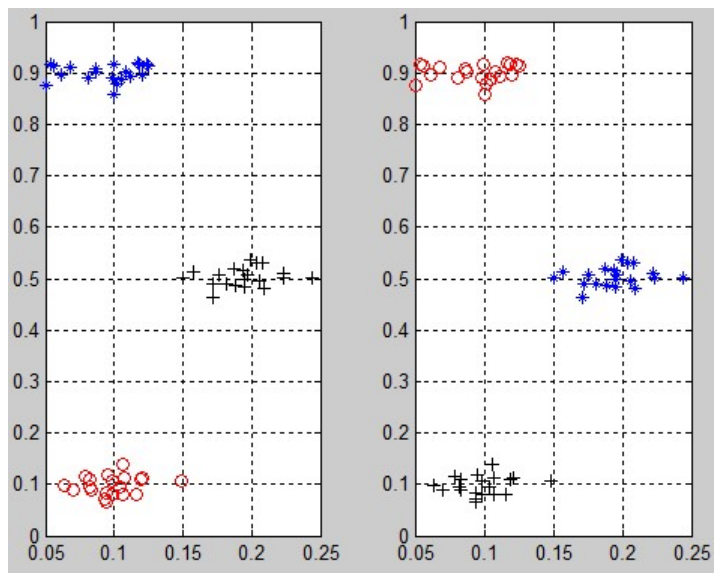


5013 Similarity

When we were children, we were always asked to do the classification homework. For example, we were given words {Tiger, Panda, Potato, Dog, Tomato, Pea, Apple, Pear, Orange, Mango} and we were required to classify these words into three groups. As you know, the correct classification was {Tiger, Panda, Dog}, {Potato, Tomato, Pea} and {Apple, Pear, Orange, Mango}. We can represent this classification with a mapping sequence {A,A,B,A,B,B,C,C,C,C}, and it means Tiger, Panda, Dog belong to group A, Potato, Tomato, Pea are in the group B, and Apple, Pear, Orange, Mango are in the group C.

But the **LABEL** of group doesn't make sense and the **LABEL** is just used to indicate different groups. So the representations {P,P,O,P,O,O,Q,Q,Q,Q} and {E,E,F,E,F,F,W,W,W,W} are equivalent to the original mapping sequence. However, the representations {A,A,A,A,B,B,C,C,C,C} and {D,D,D,D,D,D,G,G,G,G} are not equivalent.



The pupils in class submit their mapping sequences and the teacher should read and grade the homework. The teacher grades the homework by calculating the maximum similarity between pupils' mapping sequences and the answer sequence. The definition of similarity is as follow.

$$\text{Similarity}(S, T) = \text{sum}(S_i == T_i) / L$$

$L = \text{Length}(S) = \text{Length}(T)$, $i = 1, 2, \dots, L$, where $\text{sum}(S_i == T_i)$ indicates the total number of equal labels in corresponding positions.

The maximum similarity means the maximum similarities between S and all equivalent sequences of T , where S is the answer and fixed.

Now given all sequences submitted by pupils and the answer sequence, you should calculate the sequences' maximum similarity.

Input

The input contains multiple test cases. The first line is the total number of cases T ($T < 15$). The following are T blocks. Each block indicates a case. A case begins with three numbers n ($0 < n < 10000$), k ($0 < k < 27$), m ($0 < m < 30$), which are the total number of objects, groups, and students

in the class. The next line consists of n labels and each label is in the range [A...Z]. You can assume that the number of different labels in the sequence is exactly k . This sequence represents the answer. The following are m lines, each line contains n labels and each label also is in the range [A...Z]. These m lines represent the m pupils' answer sequences. You can assume that the number of different labels in each sequence doesn't exceed k .

Output

For each test case, output m lines, each line is a floating number (Round to 4 digits after the decimal point). You should output the m answers in the order of the sequences appearance.

Sample Input

```
2
10 3 3
A A B A B B C C C C
F F E F E E D D D D
X X X Y Y Y Y Z Z Z
S T R S T R S T R S
3 2 2
A B A
C D C
F F E
```

Sample Output

```
1.0000
0.7000
0.5000
1.0000
0.6667
```