Correct Answer Recovery

Filename: recovery

You've taken over for a former AP teacher who left haphazard records. You've got a copy of her students' True/False answers on last year's AP test, as well as the distribution of the scores of the students. Unfortunately, you don't know which student got which score. Based on this data, you want to see if you can reconstruct the correct answers to the test. Since it's likely that based on the data you have more than one possible set of answers could have been correct, you'll just settle for counting the number of different possible sets of answers that could have been correct.

The Problem

Given all of the students answers on a True/False test, as well as a distribution of their scores, determine the number of possible sets of answers that could have been the correct set of answers.

The Input

The first line of the input file will contain a single positive integer, n ($n \leq 100$), representing the number of classes to process. The information for each class follows. The first line of input for each class contains two space separated positive integers: q ($q \leq 15$), the number of questions on the test and s ($s \leq 40$), the number of students in the class. The next s lines will each contain a single string of length q, representing the answers a student in the class gave for the test. Each of these strings will only contain the characters 'T' and 'F', for true and false answers, respectively. The last line of each test case will contain q+1 space separated integers, $f_0, f_1, f_2, \ldots, f_q$, where f_i represents the number of students in the class who got exactly i questions correct, for $0 \leq i \leq q$. It is guaranteed that for all $0 \leq i \leq q$, $f_i \geq 0$ and $\sum_{i=0}^{q} f_i = s$. The input will be consistent, namely, there will exist at least one possible set of correct answers for the test for each test case.

The Output

For each class, output on a line by itself, the number of possible sets of answers that could have been the correct ones for the test.

Sample Input

```
2
4 3
FFFF
FTFT
TTTT
0 1 0 2 0
3 4
FFF
FFF
FTF
TTF
2 1 1 0
```

Sample Output

```
4
1
```

Sample Explanation

In the first test case, the correct answers could have been FFFT, FTFF, FTTT or TTFT. If the correct answers were either of the first two, the first two students listed would have gotten 3 correct and the last student would have gotten 1 correct. If FTTT were correct, then students 2 and 3 would have gotten 3 correct answers and the first student would have gotten 1 correct answer. Finally, if TTFT were the correct answers, then students 1 and 3 would have gotten 3 questions correct while student 2 would have gotten 1 answer correct.

In the second test case, all three answers must have been true. This is the only possibility that makes 2 students get all the questions wrong, 1 student get 1 question correct and 1 student get 2 questions correct.