Statement   Submissions   Questions

Xtreme Teams

Time limit: *4000 ms*
Memory limit: *256 MB*

In IEEEXtreme, each team consists of three students. The contest may challenge the students with problems on M topics. There are N students at a school who are known to specialize in some of those M topics (possibly none, possibly all). In order to achieve best performance, for each of the M topics, a team should have at least one student who specializes in that topic. In how many ways can a single team be formed by choosing 3 students from the N students, so that at least one student specializes in each of the M topics?

Standard input

The input begins with a single integer T on the first line, the number of test cases.

The first line of each test case has two integers N and M. The next N lines each have a string of length M that represents the topic specialties of one student. For each student, the ith letter is `y` if he/she specializes in topic i, or `n` otherwise.

Standard output

For each test case, output the number of different ways to choose 3 students to form a team on a single line.

Constraints and notes

- $1 \le T \le 15$
- $3 \le N \le 5\,000$
- $1 \le M \le 18$
- For 33% of the test files, $N \le 100$, $M \le 12$.
- For 66% of the test files, $M \le 12$.

Input	Output	Explanation
4 4 3 ynn nyn yyn yny 4 5 yyyyy yyynn nyyyn nnnny 5 4 ynnn nynn nnyn nnny nnnn 6 6 yynnyy yynnyy nnyyyy nnyyyy yyyynn yyyynn	3 4 0 20	There are 4 test cases. The first 3 cases are explained below. • Case 1: The last student must be on the team because only that student is specialized in topic 3. The other two team members can be chosen freely from the first three students, so there are 3 ways. • Case 2: The first student can team up with any other two students. Additionally, the last three students can form a team. • Case 3: There are 4 topics but all students only specialize in at most one topic. So there is no way to form a team.