Assignments

Problem

Your task will be to calculate number of different assignments of n different topics to n students such that everybody gets exactly one topic he likes.

Input

First line of input contains number of test cases c (1<=c<=80). Each test case begins with number of students n (1<=n<=20). Each of the next n lines contains n integers describing preferences of one student. 1 at the ith position means that this student likes ith topic, 0 means that he definitely doesn't want to take it.

Output

For each test case output number of different assignments (it will fit in a signed 64-bit integer).

Example

Input:
3
3
1 1 1
1 1 1
1 1 1
11
1 0 0 1 0 0 0 0 0 1 1
1 1 1 1 1 0 1 0 1 0 0
1 0 0 1 0 0 1 1 0 1 0
1 0 1 1 1 0 1 1 0 1 1
0 1 1 1 0 1 0 0 1 1 1
1 1 1 0 0 1 0 0 0 0 0
0 0 0 0 1 0 1 0 0 0 1
1 0 1 1 0 0 0 0 0 0 1
0 0 1 0 1 1 0 0 0 1 1
1 1 1 0 0 0 1 0 1 0 1
1 0 0 0 1 1 1 1 0 0 0
11
0 1 1 1 0 1 0 0 0 1 0
0 0 1 1 1 1 1 1 1 1 1
1 1 0 1 0 0 0 0 0 1 0
0 1 0 1 0 1 0 1 0 1 1
1 0 0 1 0 0 0 0 1 0 1
0 0 1 0 1 1 0 0 0 0 1
1 0 1 0 1 1 1 0 1 1 0
1 0 1 1 0 1 1 0 0 1 0
0 0 1 1 0 1 1 1 1 1 1
0 1 0 0 0 0 0 0 0 1 1
0 1 1 0 0 0 0 0 1 0 1

Output:
6
7588