The Value of Friendship



You're researching friendships between groups of n new college students where each student is distinctly numbered from n to n. At the beginning of the semester, no student knew any other student; instead, they met and formed individual friendships as the semester went on. The friendships between students are:

- Bidirectional. If student a is friends with student b, then student b is also friends with student a.
- Transitive. If student a is friends with student b and student b is friends with student c, then student a is friends with student c. In other words, two students are considered to be friends even if they are only indirectly linked through a network of mutual (i.e., directly connected) friends.

The purpose of your research is to find the maximum total value of a group's friendships, denoted by total. Each time a direct friendship forms between two students, you sum the number of friends that each of the n students has and add the sum to total.

You are given q queries, where each query is in the form of an unordered list of m distinct direct friendships between n students. For each query, find the maximum value of total among all possible orderings of formed friendships and print it on a new line.

Input Format

The first line contains an integer, q, denoting the number of queries. The subsequent lines describe each query in the following format:

- 1. The first line contains two space-separated integers describing the respective values of n (the number of students) and m (the number of distinct *direct* friendships).
- 2. Each of the m subsequent lines contains two space-separated integers describing the respective values of x and y (where $x \neq y$) describing a friendship between student x and student y.

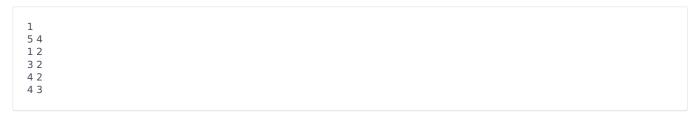
Constraints

- $1 \le q \le 16$
- $1 < n < 10^5$
- $1 \le m \le \min(\frac{n \cdot (n-1)}{2}, 2 \times 10^5)$

Output Format

For each query, print the maximum value of *total* on a new line.

Sample Input 0



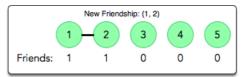
Sample Output 0

32



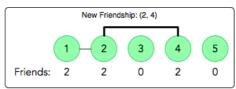
The value of total is maximal if the students form the m=4 direct friendships in the following order:

1. Students 1 and 2 become friends:



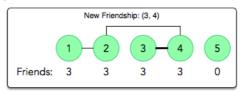
We then sum the number of friends that each student has to get 1+1+0+0+0=2.

2. Students 2 and 4 become friends:



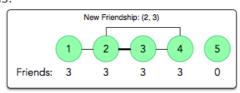
We then sum the number of friends that each student has to get 2+2+0+2+0=6.

3. Students 3 and 4 become friends:



We then sum the number of friends that each student has to get 3+3+3+3+0=12.

4. Students 3 and 2 become friends:



We then sum the number of friends that each student has to get 3+3+3+3+0=12.

When we add the sums from each step, we get total = 2 + 6 + 12 + 12 = 32. We then print 32 on a new line.