Problem E. Escaped from NEF

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

A *cactus* is a connected undirected graph in which every edge lies on at most one simple cycle. Intuitively, a cactus is a generalization of a tree where some cycles are allowed. Multiedges (multiple edges between a pair of vertices) and loops (edges that connect a vertex to itself) are not allowed in a cactus.

You are given a *directed* graph G with n vertices with the following property. Consider an *undirected* graph G' with n vertices built as follows: for each *directed* edge (u_i, v_i) in G, add an *undirected* edge $\{u_i, v_i\}$ to G'. Then G' is a cactus.

Find the number of ordered pairs of vertices (x, y) such that there exists a path from vertex x to vertex y in G. Assume that a path from a vertex to itself always exists.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10^5$). Description of the test cases follows.

The first line of each test case contains two integers n and m, denoting the number of vertices and the number of edges in G ($2 \le n \le 250\,000$; $n - 1 \le m \le \left\lfloor \frac{3(n-1)}{2} \right\rfloor$).

Each of the next m lines contains two integers u_i and v_i, denoting an edge in G directed from u_i to v_i ($1 \le u_i, v_i \le n$; $u_i \ne v_i$).

The *undirected* graph consisting of *undirected* edges $\{u_i, v_i\}$ is a cactus.

It is guaranteed that the sum of n over all test cases does not exceed 250 000.

Output

For each test case, print the number of ordered pairs (x, y) such that vertex y is reachable from vertex x in G.

Example

standard input	*standard output*
2 3 3 1 2 1 3 2 3 5 5 1 2 2 3 3 4 4 5 4 2	6 18