

Lalo's Lawyer Lost

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

Jesus, it's always the desert.

—James McGill, *Better Call Saul*

While picking up Lalo's bail, Saul and Mike got lost in a desert. In a desert, they found a cactus: a connected undirected graph on n nodes, such that every edge in it appears in at most one simple cycle.

It turned out that n is even. For some reason, Mike and Saul want to solve the following problem:

Define $d(u, v)$ as the shortest distance between nodes u and v in this cactus. Partition all n nodes into $\frac{n}{2}$ pairs (u_i, v_i) , such that every node appears in exactly one pair, and the sum of $d(u_i, v_i)$ is **maximized**.

What's the maximum possible sum of $d(u_i, v_i)$ in such a partition?

Input

The first line contains a single integer t ($1 \leq t \leq 10^5$) — the number of test cases. The description of test cases follows.

The first line of each test case contains two integers n, m ($2 \leq n \leq 2 \cdot 10^5, n - 1 \leq m \leq 4 \cdot 10^5, n$ is even) — the number of nodes and edges correspondingly.

The i -th of the next m lines contains two integers u_i, v_i ($1 \leq u_i, v_i \leq n, u_i \neq v_i$) — denoting an edge between nodes u_i and v_i . It's guaranteed that these edges form a cactus.

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$, and the sum of m over all test cases does not exceed $4 \cdot 10^5$.

Output

For each test case, output a single integer — the largest possible sum of $d(u_i, v_i)$ in such a partition.

Example

standard input	standard output
3	4
4 3	7
1 2	11
2 3	
3 4	
6 7	
1 2	
2 3	
3 1	
3 4	
4 5	
5 6	
6 4	
8 9	
1 2	
2 3	
3 1	
3 4	
4 5	
5 6	
6 7	
7 8	
8 3	