Problem L. Proposition Composition

These is an undirected connected graph G with n vertices and $(n-1)$ edges. The vertices are numbered from 1 to n (both inclusive) and the i-th edge connects vertices i and $(i+1)$.

There will be m extra edges added to this graph. Each addition is permanent. After each edge is added, output the number of ways to choose two edges e and f from the graph such that if both edges e and f are removed from the graph, the graph will become disconnected (that is, the graph will have at least two connected components).

Note that first choosing e then choosing f is considered the same way as first choosing f then choosing e.

Input

There are multiple test cases. The first line of the input contains an integer T indicating the number of test cases. For each test case:

The first line contains two integers n and m ($1 \le n, m \le 2.5 \times 10^5$) indicating the size of the graph and the number of extra edges.

For the following m lines, the i-th line contains two integers u_i and v_i ($1 \le u_i, v_i \le n$) indicating the i-th extra edge connects vertices u_i and v_i.

It's guaranteed that neither the sum of n nor the sum of m over all test cases will exceed 2.5×10^5.

Output

For each test case output m lines where the i-th line contains the answer after the i-th extra edge is added.

Example

standard input	standard output
3 4 3 2 4 4 2 3 3 7 3 3 4 1 2 1 7 6 4 1 3 4 6 2 5 3 4	6 5 6 21 24 10 15 12 3 2

Note

We explain the first sample test case as follows.

After adding the first extra edge, removing any two edges will make the graph disconnected. So the answer is 6.

After adding the second extra edge, we can choose original edge 1 and any other edge, or choose original edge 2 and original edge 3. The answer is $4 + 1 = 5$.

After adding the third extra edge, we can choose original edge 1 and any other edge, or choose original edge 2 and original edge 3. The answer is $5 + 1 = 6$.