

Problem H. Graph

Given a simple undirected connected graph G with n vertices and m edges, you need to choose two distinct edges to delete, obtaining a new graph G' , such that G' remains connected.

Let the two deleted edges be (p, q) and (u, v) . You need to minimize the sum of the shortest path between p and q in G' plus the shortest path between u and v in G' . Output this minimum value and the number of deletion schemes that achieve it.

Input

This problem has multiple test cases.

The first line contains an integer T — the number of test cases.

For each test case:

The first line contains two integers n, m .

The next m lines each contain two integers u, v , representing an edge.

The graph has no multi-edges or self-loops. It is guaranteed that at least one deletion scheme exists such that the graph remains connected.

$1 \leq T \leq 5000$, $1 \leq \sum n, \sum m \leq 5000$, $4 \leq n$, $5 \leq m$.

Output

For each test case:

Output a single line with two integers — the minimum value and the number of schemes.

Example

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