Problem A. Vertices in the Pocket

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	256 megabytes

DreamGrid has just found an undirected simple graph with n vertices and no edges (that's to say, it's a graph with n isolated vertices) in his right pocket, where the vertices are numbered from 1 to n. Now he would like to perform q operations of the following two types on the graph:

- 1 a b – Connect the a-th vertex and the b-th vertex by an edge. It's guaranteed that before this operation, there does not exist an edge which connects vertex a and b directly.
- 2 k – Find the answer for the query: What's the minimum and maximum possible number of connected components after adding k new edges to the graph. Note that after adding the k edges, the graph must still be a simple graph, and the query does NOT modify the graph.

Please help DreamGrid find the answer for each operation of the second type. Recall that a simple graph is a graph with no self loops or multiple edges.

Input

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

The first line contains two integers n and q ($1 \le n \le 10^5$, $1 \le q \le 2 \times 10^5$), indicating the number of vertices and the number of operations.

For the following q lines, the i-th line first contains an integer p_i ($p_i \in \{1, 2\}$), indicating the type of the i-th operation.

- If $p_i = 1$, two integers a_i and b_i follow ($1 \le a_i, b_i \le n$, $a_i \ne b_i$), indicating an operation of the first type. It's guaranteed that before this operation, there does not exist an edge which connects vertex a and b directly.
- If $p_i = 2$, one integer k_i follows ($0 \le k_i \le \frac{n(n-1)}{2}$), indicating an operation of the second type. It's guaranteed that after adding k_i edges to the graph, the graph is still possible to be a simple graph.

It's guaranteed that the sum of n in all test cases will not exceed 10^6, and the sum of q in all test cases will not exceed 2×10^6.

Output

For each operation of the second type output one line containing two integers separated by a space, indicating the minimum and maximum possible number of connected components in this query.

Example

standard input	standard output
1 5 5 1 1 2 2 1 1 1 3 2 1 2 3	3 3 2 3 1 2