Problem M. Vertex Separation

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

Consider an undirected graph. A pair of vertices (U, V) are said to be **separated** if the following condition holds:

- There exist two simple paths, both from U to V, whose lengths differ by *at least* 2. Note that a simple path is a path where all vertices are distinct.

A vertex U is said to be **separable** if there exists at least one other vertex V such that the pair (U, V) is separated.

You are given three integers N, M, and K. Construct any **simple connected** undirected graph with N vertices and M edges, such that it has **exactly** K separable vertices. If no such graph exists, print -1.

Input

The input is given in the following format:

$$\begin{array}{l} T \\ N\ M\ K \\ \vdots \end{array}$$

- All input values are integers.
- $1 \le T \le 10^5$
- $2 \le N \le 2 \times 10^5$
- $N - 1 \le M \le \min\left(2 \times 10^5, \frac{N \cdot (N-1)}{2}\right)$
- $0 \le K \le N$
- It is guaranteed that the sum of N and the sum of M over all test cases each won't exceed 2×10^5.

Output

For each test case:

- If it is impossible to construct such a graph, output a single integer -1.
- Otherwise, output M lines. The i-th of these lines should contain two integers U_i and V_i ($1 \le U_i, V_i \le N$, $U_i \ne V_i$) — the endpoints of the i-th edge. The graph must be **simple** (i.e. no self-loops and no repeated edges), **connected**, and have exactly K separable vertices.

If there are multiple valid graphs, any of them will be accepted.

Examples

standard input	standard output
3 2 1 1 3 2 0 4 5 4	-1 1 2 2 3 1 2 2 3 3 4 1 4 1 3

Note

Test case 1: There's only one possible graph with $N = 2$ and $M = 1$ (which is just a single edge), and it has 0 separable vertices.

Test case 2: We want 0 separable vertices, which the given graph attains.

Test case 3: All vertices are separable. For instance, vertex 1 is separable because of the pair $(1, 2)$, where the two paths $1 \to 2$ and $1 \to 4 \to 3 \to 2$ both exist and differ in length by 2.