A. Searching for Graph

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Let's call an undirected graph of n vertices p-*interesting*, if the following conditions fulfill:

- the graph contains exactly $2n + p$ edges;
- the graph doesn't contain self-loops and multiple edges;
- for any integer k ($1 \le k \le n$), any subgraph consisting of k vertices contains at most $2k + p$ edges.

A *subgraph* of a graph is some set of the graph vertices and some set of the graph edges. At that, the set of edges must meet the condition: both ends of each edge from the set must belong to the chosen set of vertices.

Your task is to find a p-*interesting* graph consisting of n vertices.

Input

The first line contains a single integer t ($1 \le t \le 5$) — the number of tests in the input. Next t lines each contains two space-separated integers: n, p ($5 \le n \le 24$; $p \ge 0$;) — the number of vertices in the graph and the interest value for the appropriate test.

It is guaranteed that the required graph exists.

Output

For each of the t tests print $2n + p$ lines containing the description of the edges of a p-*interesting* graph: the i-th line must contain two space-separated integers a_i, b_i ($1 \le a_i, b_i \le n$; $a_i \ne b_i$) — two vertices, connected by an edge in the resulting graph. Consider the graph vertices numbered with integers from 1 to n.

Print the answers to the tests in the order the tests occur in the input. If there are multiple solutions, you can print any of them.

Examples

input
1 6 0

output
1 2 1 3 1 4 1 5 1 6 2 3 2 4 2 5 2 6 3 4 3 5 3 6