Problem C. 3-colorings

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

This is an output-only problem. Note that you still have to send code which prints the output, not a text file.

A valid 3-coloring of a graph is an assignment of colors (numbers) from the set $\{1, 2, 3\}$ to each of the n vertices such that for any edge (a, b) of the graph, vertices a and b have a different color. There are at most 3^n such colorings for a graph with n vertices.

You work in a company, aiming to become a specialist in creating graphs with a given number of 3-colorings. One day, you get to know that in the evening you will receive an order to produce a graph with exactly $6k$ 3-colorings. You don't know the exact value of k, only that $1 \leq k \leq 500$.

You don't want to wait for the specific value of k to start creating the graph. Therefore, you build a graph with at most 19 vertices beforehand. Then, after learning that particular k, you are allowed to add at most 17 edges to the graph, to obtain the required graph with exactly $6k$ 3-colorings.

Can you do it?

Input

There is no input for this problem.

Output

First, output n and m ($1 \leq n \leq 19$, $1 \leq m \leq \frac{n(n-1)}{2}$) — the number of vertices and edges of the initial graph (the one built beforehand). Then, output m lines of form (u, v) — the edges of the graph.

Next, for every k from 1 to 500 do the following:

Output e — the number of edges you will add for this particular k ($1 \leq e \leq 17$). Then, output e lines of the form (u, v) — the edges you will add to your graph.

There can't be self-loops, and for every k, all $m + e$ edges you use have to be pairwise distinct. The number of 3-colorings of the graph for a particular k has to be exactly $6k$.

Example

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

Note

The sample output is given as an example. It contains the output for $k = 1, 2$.