Problem H. Hamiltonian

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

You are given a positive integer $K \leq 60$. Construct a graph with at most 20 vertices with the following property: there are exactly K unordered pairs of vertices (u, v) such that there is a Hamiltonian path between u and v in this graph.

It can be shown that, under these constraints, the solution always exists.

Recall that a Hamiltonian path is a path between two vertices of a graph that visits each vertex exactly once.

Input

The only line of the input contains a single integer K ($1 \leq K \leq 60$).

Output

On the first line, output two integers n and m ($2 \leq n \leq 20$, $0 \leq m \leq \frac{n(n-1)}{2}$), the number of vertices and the number of edges in your graph respectively.

In each of the next m lines, output two integers u and v ($1 \leq u, v \leq n$, $u \neq v$), representing the edge (u, v) of your graph. All edges have to be distinct.

Examples

standard input	standard output
1	2 1 1 2
2	4 4 1 2 1 3 2 3 3 4
3	3 3 1 2 2 3 3 1