Build the Non-Cactus

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

In graph theory, a *cactus* is a connected undirected graph in which any two simple cycles have at most one vertex in common.

Given an integer n, build a **connected** graph with n vertices that is **not** a cactus. Note that your graph can't have self-loops or multiple edges. The number of edges in your graph should be minimum possible.

Input

The input consists of a single integer n ($2 \leq n \leq 1000$).

Output

If there is no connected graph of n vertices without self-loops and multiple edges that is not a cactus, print `-1` in the only line of the output. Otherwise, first print positive integer m — the number of edges in your graph. Then print m lines, each containing two integers — edges of the resulting graph. Use consecutive integers $1, 2, \ldots, n$ to enumerate the vertices of the graph.

If there are more than solutions with minimum number of edges, print any of them.

Example

standard input	standard output
3	-1