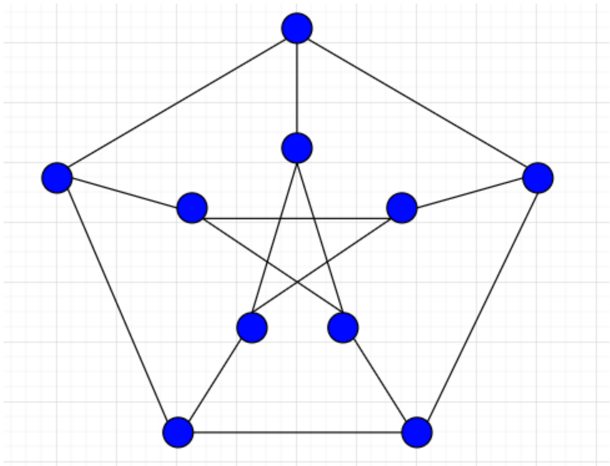
Key Properties (K)

Memory limit: 1024 MB Time limit: 1.00 s

Dwarf the Aesthete is a well-known art connoisseur. In his house, he has a large collection of paintings. His favorite painting depicts a graph on 10 vertices that looks as follows:



An illustration of the output in the first example.

One day, while admiring his favorite painting, the dwarf figured out what properties make this graph so great: it is **connected**, each vertex has **exactly** 3 **incident edges**, and the graph **contains no cycles of length** 4 (that is, there are no four edges (v_1, v_2), (v_2, v_3), (v_3, v_4), and (v_4, v_1) for any set of four distinct vertices v_1, v_2, v_3, v_4).

Shocked by this realization, Dwarf the Aesthete wondered whether there are other graphs with these properties. Since he wants to be a big figure in the art world, he is only interested in large graphs, namely those with **at least** 42 **vertices** (42 somehow seems like a cool number to him).

Help the dwarf: for a given number of vertices, produce an undirected simple graph (without loops or multiple edges between the same pair of vertices) with these properties, or determine that no such graph exists.

Input

The first and only line of input contains a single integer N, the number of vertices.

Output

If no solution exists, print `NO`.
Otherwise, in the first line, print a single integer M, the number of edges in the graph.
Each of the following M lines should contain two integers a_i and b_i ($1 \leq a_i, b_i \leq N$), representing the endpoints of an edge.
If there are multiple valid solutions, you may print any of them.

Limits

$42 \leq N \leq 10^6$.

Small examples (do not satisfy task limits)

Input	Output

`10`	`15`
	`1 2`
	`2 3`
	`3 4`
	`4 5`
	`5 1`
	`1 6`
	`2 7`
	`3 8`
	`4 9`
	`5 10`
	`6 8`
	`8 10`
	`10 7`
	`7 9`
	`9 6`

Input	Output
`8`	`NO`

Attention: the above examples do not satisfy the condition $N \geq 42$, so you are not required to pass them. The sample in the judge system has $N = 42$.