

E. The same permutation

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Seyyed and MoJaK are friends of Sajjad. Sajjad likes a permutation. Seyyed wants to change the permutation in a way that Sajjad won't like it. Seyyed thinks more swaps yield more probability to do that, so he makes MoJaK to perform a swap between every pair of positions (i, j) , where $i < j$, exactly once. MoJaK doesn't like to upset Sajjad.

Given the permutation, determine whether it is possible to swap all pairs of positions so that the permutation stays the same. If it is possible find how to do that.

Input

The first line contains single integer n ($1 \leq n \leq 1000$) — the size of the permutation.

As the permutation is not important, you can consider $a_i = i$, where the permutation is a_1, a_2, \dots, a_n .

Output

If it is not possible to swap all pairs of positions so that the permutation stays the same, print "NO",

Otherwise print "YES", then print lines: the i -th of these lines should contain two integers a and b ($a < b$) — the positions where the i -th swap is performed.

Examples

input
3
output
NO

input
1
output
YES