Problem E. Permutation Matrix

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

You are given a positive integer n. Construct such matrix $2^n \times 2^n$ that:

- The matrix contains distinct positive integers from 1 to 2^{2n}.
- The sums of elements all each submatrices of size $2^{n-1} \times 2^{n-1}$ are equal.

A submatrix is a contiguous rectangle of elements in the original matrix.

Input

The first line contains an integer n ($1 \le n \le 10$).

Output

On the very first line, print "YES" if the answer exists, or "NO" if not.

If the answer exists, print any such matrix on the next 2^n lines, with each line containing 2^n space-separated integers.

Example

standard input	*standard output*
1	NO