

Problem H. Matrices and Sums

Input file: *standard input*
Output file: *standard output*
Time limit: 1 second
Memory limit: 256 mebibytes

Given a positive integer n , you should construct an $n \times n$ integer matrix M satisfying the following conditions:

- For all elements $M_{i,j}$ ($1 \leq i, j \leq n$), the absolute value $|M_{i,j}| \leq 1$.
- The row and column sums $R_1, R_2, \dots, R_n, C_1, C_2, \dots, C_n$ are pairwise distinct, where $R_x = \sum_{i=1}^n M_{x,i}$ and $C_x = \sum_{i=1}^n M_{i,x}$.

There may exist multiple solutions or no solution.

Input

The first line contains a single integer n ($1 \leq n \leq 1000$).

Output

The first line must contain one string “Yes” (without quotes) if a solution exists, or “No” (without quotes) if there is no solution.

When a solution exists, print n more lines, each containing n integers, denoting the matrix M you construct.

If multiple solutions exist, print any one of them.

Examples

| <i>standard input</i> | <i>standard output</i> |
|-----------------------|------------------------|
| 2 | Yes 1 0 1 -1 |
| 1 | No |

Note

- In the first example, $R_1 = 1$, $R_2 = 0$, $C_1 = 2$, and $C_2 = -1$ are all distinct.
- In the second example, $R_1 = C_1$ always holds, so no solution exists.