A - Matrix

Description

Given an integer n, find an integer matrix A of the least order, which satisfies $A \neq E, A^n = E$, where E is identity matrix.

Input

The only line contains an integer $n(2 \leq n \leq 100)$.

Output

The first line contains an integer k , the order of A. Each of the following k lines should contains k integers which mean a row of A.

Absolute of any number in the output should less than 2^{30}.

If there are multiple solutions, output any of them.

Samples

Input
2
Output
1 -1

Input
3
Output
2 1 1 -3 -2

Notes

In the first sample, the only solution is (-1). In the second sample, $\begin{pmatrix} 1 & -1 \\ 3 & -2 \end{pmatrix}$, $\begin{pmatrix} 1 & 3 \\ -1 & -2 \end{pmatrix}$, $\begin{pmatrix} 1 & -3 \\ 1 & -2 \end{pmatrix}$ are also solutions.