Xor Magic Square

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

A good matrix of size N is an $N \times N$ matrix of positive integers such that the total XOR of each row, each column, and both diagonals is 0.

More precisely, an $N \times N$ matrix A is called a good matrix of size N if it satisfies all of the following conditions. Here, $x \oplus y$ denotes the bitwise XOR of x and y, and $\bigoplus_{i=1}^{N} a_i = a_1 \oplus \ldots \oplus a_N$.

- $A_{i,j}$ $(1 \le i, j \le N)$ is a positive integer
- For each $i = 1, 2, \ldots, N$, $\bigoplus_{j=1}^{N} A_{i,j} = 0$
- For each $j = 1, 2, \ldots, N$, $\bigoplus_{i=1}^{N} A_{i,j} = 0$
- $\bigoplus_{i=1}^{N} A_{i,i} = 0$
- $\bigoplus_{i=1}^{N} A_{i,N-i+1} = 0$

A positive integer N is given.

Among all good matrices of size N, output one whose total sum of all elements, $\sum_{1 \le i,j \le N} A_{i,j}$, is minimum.

If no good matrix of size N exists, report that.

Input

The input consists of a single integer N. $(1 \le N \le 2 \times 10^3)$

Output

If no good matrix of size N exists, print -1 on a single line.

If it exists, print the minimum possible total sum of all elements on the first line.

Then print the matrix A in the following N lines, with elements separated by spaces. That is, the $(i+1)$-th line should contain the elements of the i-th row of matrix A, separated by spaces.

If there are multiple solutions, any of them may be printed.

Examples

standard input	standard output

`2`	`4`
	`1 1`
	`1 1`

`1`	`-1`

Note

For the first example, the total XOR of each row, each column, and both diagonals is 0, so it satisfies the conditions for a good matrix. Also, among all good matrices of size 2, the total sum of all elements cannot be made smaller than 4, so the minimum value is 4.

For the second example, there is no good matrix of size 1, so print -1.

The bitwise XOR $x \oplus y$ of non-negative integers x, y is defined as follows.

- In the binary representation of $x \oplus y$, the digit at the 2^k ($k \geq 0$) place is 1 if and only if exactly one of the digits at the 2^k place in the binary representations of x and y is 1; otherwise, it is 0.

For example, $3 \oplus 5 = 6$ (in binary, $011 \oplus 101 = 110$).