

Problem D. Dewar's

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

Your need to find a positive integer A in base n such that the concatenation of A with itself is a perfect square, or determine that such number does not exist.

Input

You are given one line with integer n ($2 \leq n \leq 10^7$).

Output

If such number A does not exist or has more than 3000 digits in base n , print only two lines with zeroes.

In the other case, on the first line, print the number of digits of integer A in base n , and on the second line, print its digits. Represent each digit by a decimal number from 0 to $n - 1$. Separate consecutive digits by spaces. Note that A must not contain **leading zeroes**. The number of n -based digits in this number must not exceed 3000.

On the third and fourth line, print \sqrt{AA} in base n in the same format, where \overline{AA} is a number in base n obtained from concatenation of A with itself. This number also must not contain leading zeroes.

Examples

standard input	standard output
2	3 1 0 0 3 1 1 0
3	1 1 1 2
32	2 20 16 2 25 20

Note

First example: $100100_2 = 36_{10} = 6^2$.