D. Dima and Lisa

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Dima loves representing an odd number as the sum of multiple primes, and Lisa loves it when there are at most three primes. Help them to represent the given number as the sum of at most than three primes.

More formally, you are given an **odd** numer n. Find a set of numbers p_i $(1 \le i \le k)$, such that

1. $1 \le k \le 3$
2. p_i is a prime
3.

The numbers p_i do not necessarily have to be distinct. It is guaranteed that at least one possible solution exists.

Input

The single line contains an odd number n $(3 \le n < 10^9)$.

Output

In the first line print k $(1 \le k \le 3)$, showing how many numbers are in the representation you found.

In the second line print numbers p_i in any order. If there are multiple possible solutions, you can print any of them.

Examples

input
27

output
3 5 11 11

Note

A prime is an integer strictly larger than one that is divisible only by one and by itself.