A. Bachgold Problem

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

Bachgold problem is very easy to formulate. Given a positive integer n represent it as a sum of **maximum possible** number of prime numbers. One can prove that such representation exists for any integer greater than 1.

Recall that integer k is called *prime* if it is greater than 1 and has exactly two positive integer divisors — 1 and k.

Input

The only line of the input contains a single integer n ($2 \le n \le 100\,000$).

Output

The first line of the output contains a single integer k — maximum possible number of primes in representation.

The second line should contain k primes with their sum equal to n. You can print them in any order. If there are several optimal solution, print any of them.

Examples

input
5
output
2 2 3

input
6
output
3 2 2 2