Number Coloring

Time Limit: 1.0s **Memory Limit:** 256M

Consider numbers $2, 3, 4, \ldots, N$ (the first N positive integers except 1). You want to color them in such a way that there is no triple of (not necessarily distinct) same-colored numbers a, b, c such that $a \cdot b = c$.

What is the minimum number of colors you can use?

Input

The first line contains the integer N.

- $2 \leq N \leq 10^6$

Output

In the first line print the minimum possible number of colors used.

In the second line print $N - 1$ numbers-- the coloring of numbers $2, 3, \ldots, N$ in your solution. Colors should be consecutive integers starting from 1. If there are multiple optimal colorings, print any of them.

Example

Input 1:

```
3
```

Output 1:

```
1
1 1
```

Input 2:

```
4
```

Output 2:

```
2
1 2 2
```

Explanation

Input 1: It is possible to color both 2 and 3 with the same color, thus using only one color, which is the minimum possible.

Input 2: One can't color numbers 2 and 4 with the same color, as $2 \cdot 2 = 4$. Note that colorings $2\ 2\ 1$, $2\ 1\ 1$, and $1\ 1\ 2$ (and only them) will be accepted as well.