DMOPC '21 Contest 5 P2 - Permutations & Primes

Time limit: 2.0s **Memory limit:** 256M

Given an integer N, find any permutation $p_1, p_2, \ldots, p_N$ of $1, 2, \ldots, N$ such that $p_1 + p_2 + \cdots + p_{i-1} + p_i$ is not prime for every integer $1 \leq i \leq N$, or report that no such permutation exists.

Constraints

$1 \leq N \leq 10^6$

Input Specification

The first and only line of input contains a single integer N.

Output Specification

If there exists no valid permutation, output -1 on a line by itself.

Otherwise, output N space-separated integers on a single line, representing a permutation $p_1, p_2, \ldots, p_N$ of $1, 2, \ldots, N$ where no prefix sum is prime.

Sample Input

```
5
```

Sample Output

```
4 5 3 2 1
```

Explanation

The prefix sums are: $p_1 = 4$, $p_1 + p_2 = 9$, $p_1 + p_2 + p_3 = 12$, $p_1 + p_2 + p_3 + p_4 = 14$, and $p_1 + p_2 + p_3 + p_4 + p_5 = 15$.

None of 4, 9, 12, 14, or 15 are prime, so this is a valid permutation.