DMOPC '21 Contest 5 P6 - Permutations & Primes

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

Given an integer N, find the lexicographically smallest permutation $p_1, p_2, \ldots, p_N$ of $1, 2, \ldots, N$ such that $i + p_i$ is prime for all $1 \leq i \leq N$, or report that no such permutation exists.

Constraints

$1 \leq N \leq 10^6$

Subtask 1 [5%]

$1 \leq N \leq 10$

Subtask 2 [25%]

$1 \leq N \leq 100$

Subtask 3 [15%]

$1 \leq N \leq 10^3$

Subtask 4 [30%]

$1 \leq N \leq 10^4$

Subtask 5 [25%]

No additional constraints.

Input Specification

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

Output Specification

If no such permutation exists, output -1 on a line by itself. Otherwise, output N space-separated integers $p_1, p_2, \ldots, p_N$, the lexicographically smallest permutation such that $i + p_i$ is prime for all $1 \leq i \leq N$.

Sample Input

```
3
```

Sample Output

```
1 3 2
```

Explanation

Note that $1 + p_1 = 1 + 1 = 2$, $2 + p_2 = 2 + 3 = 5$, and $3 + p_3 = 3 + 2 = 5$ are all prime.