DMOPC '21 Contest 5 P1 - Permutations & Primes

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

At the Phoenix Wonderland carnival, you found a mysterious booth that proposes an interesting challenge. The operator (some strange floating nuigurumi) will give you an integer N, and you are to find any permutation $p_1, p_2, \ldots, p_N$ of $1, 2, \ldots, N$ wherein every adjacent sum in the permutation is non-prime. That is, for all $1 \leq i < N$, we must have $p_i + p_{i+1}$ be non-prime. Can you find any such permutation, or determine that none exists?

Constraints

$1 \leq N \leq 10^6$

Subtask 1 [10%]

$1 \leq N \leq 4$

Subtask 2 [20%]

$1 \leq N \leq 10$

Subtask 3 [30%]

$1 \leq N \leq 3 \times 10^3$

Subtask 4 [40%]

No additional constraints.

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 $1, 2, \ldots, N$ wherein every adjacent sum in the permutation is non-prime.

Sample Input 1

```
7
```

Sample Output 1

```
7 2 4 6 3 5 1
```

Explanation for Sample 1

Note that the adjacent pairs have sums of $9, 6, 10, 9, 8, 6$, none of which are prime.

Sample Input 2

```
2
```

Sample Output 2

```
-1
```

Explanation for Sample 2

Note that $1 + 2 = 3$ which is prime, so regardless of order the sum of the one pair is prime.