2992. Number of Self-Divisible Permutations

Description

Given an integer `n`, return *the number of **permutations** of the **1-indexed** array* `nums = [1, 2, ..., n]` *, such that it's **self-divisible***.

A **1-indexed** array `a` of length `n` is **self-divisible** if for every `1 <= i <= n`, `gcd(a[i], i) == 1`.

A **permutation** of an array is a rearrangement of the elements of that array, for example here are all of the permutations of the array `[1, 2, 3]`:

- `[1, 2, 3]`
- `[1, 3, 2]`
- `[2, 1, 3]`
- `[2, 3, 1]`
- `[3, 1, 2]`
- `[3, 2, 1]`

Example 1:

```
Input: n = 1
Output: 1
Explanation: The array [1] has only 1 permutation which is self-divisible.
```

Example 2:

```
Input: n = 2
Output: 1
Explanation: The array [1,2] has 2 permutations and only one of them is self-divisible:
nums = [1,2]: This is not self-divisible since gcd(nums[2], 2) != 1.
nums = [2,1]: This is self-divisible since gcd(nums[1], 1) == 1 and gcd(nums[2], 2) == 1.
```

Example 3:

```
Input: n = 3
Output: 3
Explanation: The array [1,2,3] has 3 self-divisble permutations: [1,3,2], [3,1,2], [2,3,1].
It can be shown that the other 3 permutations are not self-divisible. Hence the answer is 3.
```

Constraints:

- `1 <= n <= 12`