Problem 2584: Split the Array to Make Coprime Products

Problem Information

Difficulty: Hard
Acceptance Rate: 28.52%
Paid Only: No
Tags: Array, Hash Table, Math, Number Theory

Problem Description

You are given a **0-indexed** integer array `nums` of length `n`.

A **split** at an index `i` where `0 <= i <= n - 2` is called **valid** if the product of the first `i + 1` elements and the product of the remaining elements are coprime.

* For example, if `nums = [2, 3, 3]`, then a split at the index `i = 0` is valid because `2` and `9` are coprime, while a split at the index `i = 1` is not valid because `6` and `3` are not coprime. A split at the index `i = 2` is not valid because `i == n - 1`.

Return _the smallest index_`i` _at which the array can be split validly or_`-1` _if there is no such split_.

Two values `val1` and `val2` are coprime if `gcd(val1, val2) == 1` where `gcd(val1, val2)` is the greatest common divisor of `val1` and `val2`.

Example 1:

Input: nums = [4,7,8,15,3,5] **Output:** 2 **Explanation:** The table above shows the values of the product of the first i + 1 elements, the remaining elements, and their gcd at each index i. The only valid split is at index 2.

Example 2:

Input: nums = [4,7,15,8,3,5] **Output:** -1 **Explanation:** The table above shows the values of the product of the first i + 1 elements, the remaining elements, and their gcd at each index i. There is no valid split.

Constraints:

* `n == nums.length` * `1 <= n <= 104` * `1 <= nums[i] <= 106`

Code Snippets

C++:

```
class Solution {
public:
int findValidSplit(vector<int>& nums) {

}
};
```

Java:

```
class Solution {
public int findValidSplit(int[] nums) {

}
}
```

Python3:

```
class Solution:
def findValidSplit(self, nums: List[int]) -> int:
```