Problem 2197: Replace Non-Coprime Numbers in Array

Problem Information

Difficulty: Hard
Acceptance Rate: 57.56%
Paid Only: No
Tags: Array, Math, Stack, Number Theory

Problem Description

You are given an array of integers `nums`. Perform the following steps:

1. Find **any** two **adjacent** numbers in `nums` that are **non-coprime**. 2. If no such numbers are found, **stop** the process. 3. Otherwise, delete the two numbers and **replace** them with their **LCM (Least Common Multiple)**. 4. **Repeat** this process as long as you keep finding two adjacent non-coprime numbers.

Return _the**final** modified array._ It can be shown that replacing adjacent non-coprime numbers in **any** arbitrary order will lead to the same result.

The test cases are generated such that the values in the final array are **less than or equal** to `108`.

Two values `x` and `y` are **non-coprime** if `GCD(x, y) > 1` where `GCD(x, y)` is the **Greatest Common Divisor** of `x` and `y`.

Example 1:

Input: nums = [6,4,3,2,7,6,2] **Output:** [12,7,6] **Explanation:** - (6, 4) are non-coprime with LCM(6, 4) = 12. Now, nums = [**_12_** ,3,2,7,6,2]. - (12, 3) are non-coprime with LCM(12, 3) = 12. Now, nums = [**_12_** ,2,7,6,2]. - (12, 2) are non-coprime with LCM(12, 2) = 12. Now, nums = [**_12_** ,7,6,2]. - (6, 2) are non-coprime with LCM(6, 2) = 6. Now, nums = [12,7,_**6**_]. There are no more adjacent non-coprime numbers in nums. Thus, the final modified array is [12,7,6]. Note that there are other ways to obtain the same resultant array.

Example 2:

Input: nums = [2,2,1,1,3,3,3] **Output:** [2,1,1,3] **Explanation:** - (3, 3) are non-coprime with LCM(3, 3) = 3. Now, nums = [2,2,1,1,_**3**_ ,3]. - (3, 3) are non-coprime with LCM(3, 3) = 3. Now, nums = [2,2,1,1,_**3**_]. - (2, 2) are non-coprime with LCM(2, 2) = 2. Now, nums = [_**2**_ ,1,1,3]. There are no more adjacent non-coprime numbers in nums. Thus, the final modified array is [2,1,1,3]. Note that there are other ways to obtain the same resultant array.

Constraints:

* `1 <= nums.length <= 105` * `1 <= nums[i] <= 105` * The test cases are generated such that the values in the final array are **less than or equal** to `108`.

Code Snippets

C++:

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

}
};
```

Java:

```
class Solution {
public List<Integer> replaceNonCoprimes(int[] nums) {

}
}
```

Python3:

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