Problem 3315: Construct the Minimum Bitwise Array II

Problem Information

Difficulty: Medium
Acceptance Rate: 35.51%
Paid Only: No
Tags: Array, Bit Manipulation

Problem Description

You are given an array `nums` consisting of `n` prime integers.

You need to construct an array `ans` of length `n`, such that, for each index `i`, the bitwise `OR` of `ans[i]` and `ans[i] + 1` is equal to `nums[i]`, i.e. `ans[i] OR (ans[i] + 1) == nums[i]`.

Additionally, you must **minimize** each value of `ans[i]` in the resulting array.

If it is _not possible_ to find such a value for `ans[i]` that satisfies the **condition** , then set `ans[i] = -1`.

Example 1:

Input: nums = [2,3,5,7]

Output: [-1,1,4,3]

Explanation:

* For `i = 0`, as there is no value for `ans[0]` that satisfies `ans[0] OR (ans[0] + 1) = 2`, so `ans[0] = -1`. * For `i = 1`, the smallest `ans[1]` that satisfies `ans[1] OR (ans[1] + 1) = 3` is `1`, because `1 OR (1 + 1) = 3`. * For `i = 2`, the smallest `ans[2]` that satisfies `ans[2] OR (ans[2] + 1) = 5` is `4`, because `4 OR (4 + 1) = 5`. * For `i = 3`, the smallest `ans[3]` that satisfies `ans[3] OR (ans[3] + 1) = 7` is `3`, because `3 OR (3 + 1) = 7`.

Example 2:

Input: nums = [11,13,31]

Output: [9,12,15]

Explanation:

* For `i = 0`, the smallest `ans[0]` that satisfies `ans[0] OR (ans[0] + 1) = 11` is `9`, because `9 OR (9 + 1) = 11`. * For `i = 1`, the smallest `ans[1]` that satisfies `ans[1] OR (ans[1] + 1) = 13` is `12`, because `12 OR (12 + 1) = 13`. * For `i = 2`, the smallest `ans[2]` that satisfies `ans[2] OR (ans[2] + 1) = 31` is `15`, because `15 OR (15 + 1) = 31`.

Constraints:

* `1 <= nums.length <= 100` * `2 <= nums[i] <= 109` * `nums[i]` is a prime number.

Code Snippets

C++:

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

}
};
```

Java:

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

}
}
```

Python3:

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