Problem 2564: Substring XOR Queries

Problem Information

Difficulty: Medium
Acceptance Rate: 35.16%
Paid Only: No
Tags: Array, Hash Table, String, Bit Manipulation

Problem Description

You are given a **binary string** `s`, and a **2D** integer array `queries` where `queries[i] = [firsti, secondi]`.

For the `ith` query, find the **shortest substring** of `s` whose **decimal value** , `val`, yields `secondi` when **bitwise XORed** with `firsti`. In other words, `val ^ firsti == secondi`.

The answer to the `ith` query is the endpoints (**0-indexed**) of the substring `[lefti, righti]` or `[-1, -1]` if no such substring exists. If there are multiple answers, choose the one with the **minimum** `lefti`.

Return an array `ans` _where_ `ans[i] = [lefti, righti]` _is the answer to the_ `ith` _query._

A **substring** is a contiguous non-empty sequence of characters within a string.

Example 1:

Input: s = "101101", queries = [[0,5],[1,2]] **Output:** [[0,2],[2,3]] **Explanation:** For the first query the substring in range [0,2] is **" 101"** which has a decimal value of **5** , and **5 ^ 0 = 5** , hence the answer to the first query is [0,2]. In the second query, the substring in range [2,3] is **" 11",** and has a decimal value of **3** , and **3 ^ 1 = 2**. So, [2,3] is returned for the second query.

Example 2:

Input: s = "0101", queries = [[12,8]] **Output:** [[-1,-1]] **Explanation:** In this example there is no substring that answers the query, hence [-1,-1] is returned.

Example 3:

Input: s = "1", queries = [[4,5]] **Output:** [[0,0]] **Explanation:** For this example, the substring in range [0,0] has a decimal value of **1** , and **1 ^ 4 = 5**. So, the answer is [0,0].

Constraints:

* `1 <= s.length <= 104` * `s[i]` is either `'0'` or `'1'`. * `1 <= queries.length <= 105` * `0 <= firsti, secondi <= 109`

Code Snippets

C++:

```
class Solution {
public:
vector<vector<int>> substringXorQueries(string s, vector<vector<int>>&
queries) {

}
};
```

Java:

```
class Solution {
public int[][] substringXorQueries(String s, int[][] queries) {

}
}
```

Python3:

```
class Solution:
def substringXorQueries(self, s: str, queries: List[List[int]]) ->
List[List[int]]:
```