2564. Substring XOR Queries

Description

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

For the `i^th` query, find the **shortest substring** of `s` whose **decimal value**, `val`, yields `second_i` when **bitwise XORed** with `first_i`. In other words, `val ^ first_i == second_i`.

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

Return an array `ans` *where* `ans[i] = [left_i, right_i]` *is the answer to the* `i^th` *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 <= 10^4`
- `s[i]` is either `'0'` or `'1'`.
- `1 <= queries.length <= 10^5`
- `0 <= first_i, second_i <= 10^9`