Problem 3677: Count Binary Palindromic Numbers

Problem Information

Difficulty: Hard
Acceptance Rate: 25.23%
Paid Only: No
Tags: Math, Bit Manipulation

Problem Description

You are given a **non-negative** integer `n`.

A **non-negative** integer is called **binary-palindromic** if its binary representation (written without leading zeros) reads the same forward and backward.

Return the number of integers `k` such that `0 <= k <= n` and the binary representation of `k` is a palindrome.

Note: The number 0 is considered binary-palindromic, and its representation is `"0"`.

Example 1:

Input: n = 9

Output: 6

Explanation:

The integers `k` in the range `[0, 9]` whose binary representations are palindromes are:

* `0 -> "0"` * `1 -> "1"` * `3 -> "11"` * `5 -> "101"` * `7 -> "111"` * `9 -> "1001"`

All other values in `[0, 9]` have non-palindromic binary forms. Therefore, the count is 6.

Example 2:

Input: n = 0

Output: 1

Explanation:

Since `"0"` is a palindrome, the count is 1.

Constraints:

* `0 <= n <= 1015`

Code Snippets

C++:

```
class Solution {
public:
int countBinaryPalindromes(long long n) {

}
};
```

Java:

```
class Solution {
public int countBinaryPalindromes(long n) {

}
}
```

Python3:

```
class Solution:
def countBinaryPalindromes(self, n: int) -> int:
```