481. Magical String

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Notes

A magical string **S** consists of only '1' and '2' and obeys the following rules:

The string **S** is magical because concatenating the number of contiguous occurrences of characters '1' and '2' generates the string **S** itself.

The first few elements of string **S** is the following: **S** = "1221121221221121122……"

If we group the consecutive '1's and '2's in **S**, it will be:

1 22 11 2 1 22 1 22 11 2 11 22 ……

and the occurrences of '1's or '2's in each group are:

1 2 2 1 1 2 1 2 2 1 2 2 ……

You can see that the occurrence sequence above is the **S** itself.

Given an integer N as input, return the number of '1's in the first N number in the magical string **S**.

Note: N will not exceed 100,000.

Example 1:

```
Input: 6
Output: 3
Explanation: The first 6 elements of magical string S is "12211" and it contains three 1's, so return 3.
```

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C++

```
class Solution {
public:
    int magicalString(int n) {
        if(n <= 0) return 0;
        string str = "122";
        int i = 2;
        while(str.size() < n) {
            str += string(str[i++] - '0', str.back() ^ 0b11);
        }
        return count(str.begin(), str.begin() + n, '1');

    }
};
```

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