1411. Number of Ways to Paint N × 3 Grid

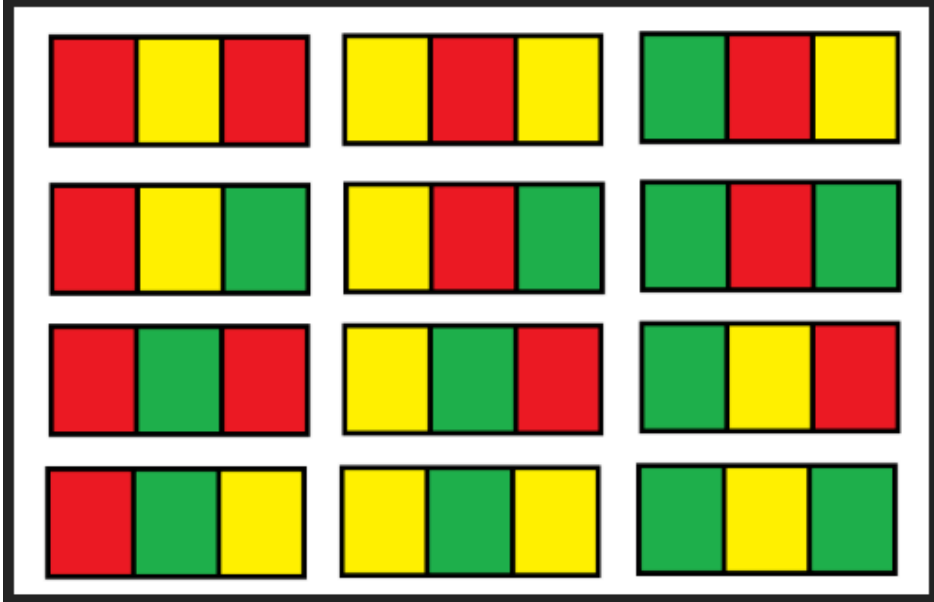
Solved

Hard | Topics | Companies | Hint

You have a `grid` of size `n x 3` and you want to paint each cell of the grid with exactly one of the three colors: **Red**, **Yellow,** or **Green** while making sure that no two adjacent cells have the same color (i.e., no two cells that share vertical or horizontal sides have the same color).

Given `n` the number of rows of the grid, return *the number of ways* you can paint this `grid`. As the answer may grow large, the answer **must be** computed modulo `10^9 + 7`.

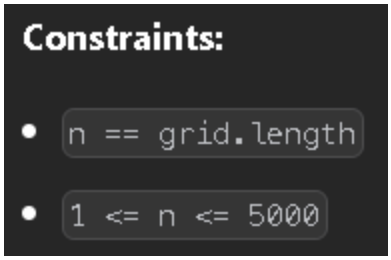
Example 1:



```
Input: n = 1
Output: 12
Explanation: There are 12 possible way to paint the grid as shown.
```

Example 2:

```
Input: n = 5000
Output: 30228214
```



Python:

```
class Solution:
    def numOfWays(self, n: int) -> int:
        MOD = 10**9 + 7
        A = B = 6

        for _ in range(2, n + 1):
            A, B = (2*A + 2*B) % MOD, (2*A + 3*B) % MOD

        return (A + B) % MOD
```

JavaScript:

```
var numOfWays = function(n) {
    const MOD = 1000000007;
    let A = 6, B = 6;

    for (let i = 2; i <= n; i++) {
        const newA = (2 * A + 2 * B) % MOD;
        const newB = (2 * A + 3 * B) % MOD;
        A = newA;
        B = newB;
    }

    return (A + B) % MOD;
};
```

Java:

```
class Solution {
    public int numOfWays(int n) {
        final int MOD = 1_000_000_007;
        long A = 6, B = 6;
        for (int i = 2; i <= n; i++) {
            long newA = (2 * A + 2 * B) % MOD;
            long newB = (2 * A + 3 * B) % MOD;
            A = newA;
            B = newB;
        }return (int) ((A + B) % MOD);}}
```