An **n-bit gray code sequence** is a sequence of 2n integers where:

* Every integer is in the **inclusive** range [0, 2n - 1],
* The first integer is 0,
* An integer appears **no more than once** in the sequence,
* The binary representation of every pair of **adjacent** integers differs by **exactly one bit**, and
* The binary representation of the **first** and **last** integers differs by **exactly one bit**.

Given an integer n, return *any valid* ***n-bit gray code sequence***.

**Example 1:**

Input: n = 2  
Output: [0,1,3,2]  
Explanation:  
The binary representation of [0,1,3,2] is [00,01,11,10].  
- 00 and 01 differ by one bit  
- 01 and 11 differ by one bit  
- 11 and 10 differ by one bit  
- 10 and 00 differ by one bit  
[0,2,3,1] is also a valid gray code sequence, whose binary representation is [00,10,11,01].  
- 00 and 10 differ by one bit  
- 10 and 11 differ by one bit  
- 11 and 01 differ by one bit  
- 01 and 00 differ by one bit

**Example 2:**

Input: n = 1  
Output: [0,1]

**Constraints:**

* 1 <= n <= 16