The gray code is a binary numeral system where two successive values differ in only one bit.

Given a non-negative integer *n* representing the total number of bits in the code, print the sequence of gray code. A gray code sequence must begin with 0.

**Example 1:**

**Input:** 2

**Output:** [0,1,3,2]

**Explanation:**

00 - 0

01 - 1

11 - 3

10 - 2

For a given *n*, a gray code sequence may not be uniquely defined.

For example, [0,2,3,1] is also a valid gray code sequence.

00 - 0

10 - 2

11 - 3

01 - 1

**Example 2:**

**Input:** 0

**Output:** [0]

**Explanation:** We define the gray code sequence to begin with 0.

  A gray code sequence of *n* has size = 2n, which for *n* = 0 the size is 20 = 1.

  Therefore, for *n* = 0 the gray code sequence is [0].