Bit-Manipulation

video-21

Leetcode
-1829

Medium

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Something
Big Coming on 100K

Trey this channel to
see "Life behind the Scenes"

Motivation

You will not see the change until you start. The right day to start is TODAY.

It's never too late.

Go for it, you can do it...

#

1829. Maximum XOR for Each Query

Medium | Topics | Companies | Hint

You are given a **sorted** array `nums` of `n` non-negative integers and an integer `maximumBit`. You want to perform the following query `n` **times**:

1. Find a non-negative integer `k < 2^maximumBit` such that `nums[0] XOR nums[1] XOR ... XOR nums[nums.length-1] XOR k` is **maximized**. `k` is the answer to the `i^th` query.
2. Remove the **last** element from the current array `nums`.

Return *an array* `answer`, *where* `answer[i]` *is the answer to the* `i^th` *query*.

Example:- nums = [0, 1, 1, 3], n = 4

maximumBit = 2

K = 0, 1, 2, 3

Output:- [0, 3, 2, 3]

K K K K

0 <= nums[i] < 2^maxBit

(0 ^ 1) = 1

01 ^ K

Thought Process

nums = [0, 1, 1, 2], MBit = 2

XOR = 0 ^ 1 ^ 1 ^ 2 = 2 → "01"

01 ^ K =

flip of this = 10 →

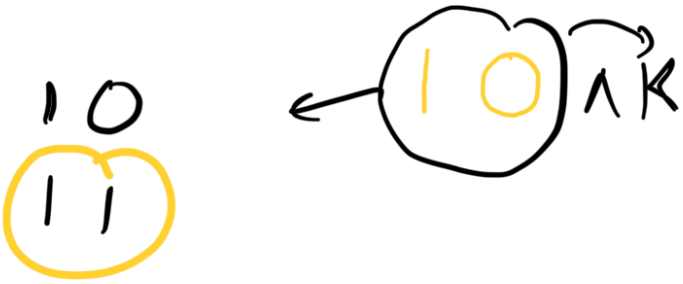
0 1
1 0
---
1 1

How to flip ???

nums = [0, 1, 1, 2] , maxBit = 2

XOR = 0^1^1^2 = 2

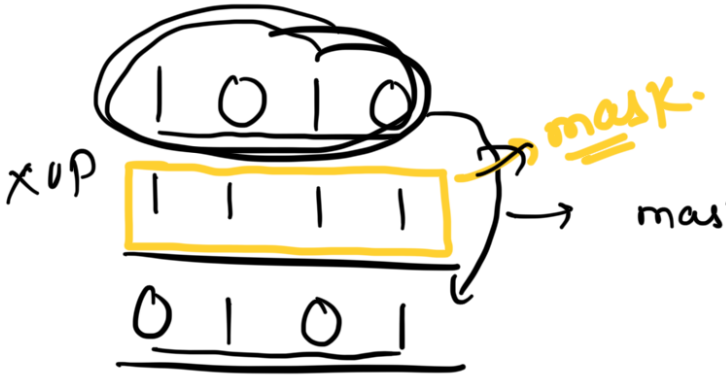
$0 <= nums[i] < 2^2$



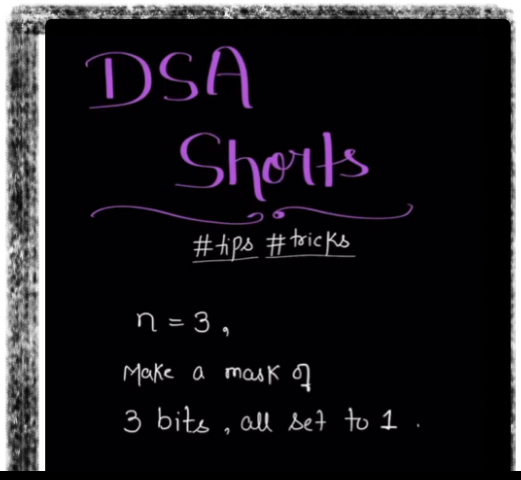
$2^2 = 4$

$2^2 - 1$

$= 3 = 11$



mask of 4-bits & all set to 1



Youtube Short...

→ $(2^n - 1)$

$n = 3$

$(1<<n) - 1$

$2^3 - 1$

$= 8 - 1 = 7 \rightarrow$ "111"

flip

XOR ∧ 01

10

10

01

11

m = 2

flip :-

$2^2 - 1 = 11$

10

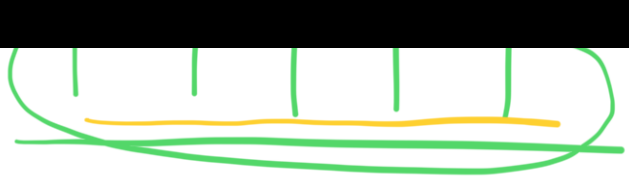
xor 11

01

0 1 0 1 0

XOR 1 0 1 0 1

flip



[0, 1, 1, 3]