

QUESTION 1:

Given a binary matrix `A`, we want to flip the image horizontally, then invert it, and return the resulting image.

To flip an image horizontally means that each row of the image is reversed. For example, flipping `[1, 1, 0]` horizontally results in `[0, 1, 1]`.

To invert an image means that each `0` is replaced by `1`, and each `1` is replaced by `0`. For example, inverting `[0, 1, 1]` results in `[1, 0, 0]`.

Write the method which take two dimensional int array and return two dimensional int array.

Example 1:

Input: `[[1,1,0],[1,0,1],[0,0,0]]`

Output: `[[1,0,0],[0,1,0],[1,1,1]]`

Explanation: First reverse each row: `[[0,1,1],[1,0,1],[0,0,0]]`.

Then, invert the image: `[[1,0,0],[0,1,0],[1,1,1]]`

Example 2:

Input: `[[1,1,0,0],[1,0,0,1],[0,1,1,1],[1,0,1,0]]`

Output: `[[1,1,0,0],[0,1,1,0],[0,0,0,1],[1,0,1,0]]`

Explanation: First reverse each row: `[[0,0,1,1],[1,0,0,1],[1,1,1,0],[0,1,0,1]]`.

Then invert the image: `[[1,1,0,0],[0,1,1,0],[0,0,0,1],[1,0,1,0]]`

Notes:

- `1 <= A.length = A[0].length <= 20`
- `0 <= A[i][j] <= 1`

QUESTION 2:

Create the method takes one parameter as String Roman value and convert it to integer and the method returns int.

Roman numerals are represented by seven different symbols: I, V, X, L, C, D and M.

Symbol	Value
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

For example, two is written as II in Roman numeral, just two one's added together. Twelve is written as, XII, which is simply X + II. The number twenty seven is written as XXVII, which is XX + V + II.

Roman numerals are usually written largest to smallest from left to right. However, the numeral for four is not IIII. Instead, the number four is written as IV. Because the one is before the five we subtract it making four. The same principle applies to the number nine, which is written as IX. There are six instances where subtraction is used:

- I can be placed before V (5) and X (10) to make 4 and 9.
- X can be placed before L (50) and C (100) to make 40 and 90.
- C can be placed before D (500) and M (1000) to make 400 and 900.

Given a roman numeral, convert it to an integer. Input is guaranteed to be within the range from 1 to 3999.

Example 1:

Input: "III"

Output: 3

Example 2:

Input: "IV"

Output: 4

Example 3:

Input: "IX"

Output: 9

Example 4:

Input: "LVIII"

Output: 58

Explanation: L = 50, V= 5, III = 3.

Example 5:

Input: "MCMXCIV"

Output: 1994

Explanation: M = 1000, CM = 900, XC = 90 and IV = 4.

QUESTION – 3: (It was chase interview question)

Create a method takes one int and return true if the number is happy.

Write an algorithm to determine if a number n is "happy".

A happy number is a number defined by the following process: Starting with any positive integer, replace the number by the sum of the squares of its digits, and repeat the process until the number equals 1 (where it will stay), or it **loops endlessly in a cycle** which does not include 1. Those numbers for which this process **ends in 1** are happy numbers.

Return True if n is a happy number, and False if not.

Example:

Input: 19

Output: true

Explanation:

$1^2 + 9^2 = 82$

$$8_2 + 2_2 = 6_8$$

$$6_2 + 8_2 = 10_0$$

$$1_2 + 0_2 + 0_2 = 1$$

QUESTION 4:

Create a method takes two parameter one is array of int second is step number and return rotated array.

Given an array, rotate the array to the right by k steps, where k is non-negative.

Example 1:

Input: [1,2,3,4,5,6,7] and $k = 3$

Output: [5,6,7,1,2,3,4]

Explanation:

rotate 1 steps to the right: [7,1,2,3,4,5,6]

rotate 2 steps to the right: [6,7,1,2,3,4,5]

rotate 3 steps to the right: [5,6,7,1,2,3,4]

Example 2:

Input: [-1,-100,3,99] and $k = 2$

Output: [3,99,-1,-100]

Explanation:

rotate 1 steps to the right: [99,-1,-100,3]

rotate 2 steps to the right: [3,99,-1,-100]

Note:

- Try to come up as many solutions as you can, there are at least 3 different ways to solve this problem.
- Could you do it in-place with $O(1)$ extra space?