# 1.Two Sum(easy)

Given an array of integers, return **indices** of the two numbers such that they add up to a specific target.

You may assume that each input would have ***exactly*** one solution, and you may not use the *same* element twice.

**Example:**

Given nums = [2, 7, 11, 15], target = 9,

Because nums[**0**] + nums[**1**] = 2 + 7 = 9,

return [**0**, **1**].

输入：

[3,2,4]

6

输出：

[1,2]

# 7. Reverse Integer（easy）

Given a 32-bit signed integer, reverse digits of an integer.

**Example 1:**

**Input:** 123

**Output:** 321

**Example 2:**

**Input:** -123

**Output:** -321

**Example 3:**

**Input:** 120

**Output:** 21

**Note:**  
Assume we are dealing with an environment which could only hold integers within the 32-bit signed integer range. For the purpose of this problem, assume that your function returns 0 when the reversed integer overflows.

# 9. Palindrome Number(easy)

Determine whether an integer is a palindrome. Do this without extra space.

**Some hints:**

Could negative integers be palindromes? (ie, -1)

If you are thinking of converting the integer to string, note the restriction of using extra space.

You could also try reversing an integer. However, if you have solved the problem "Reverse Integer", you know that the reversed integer might overflow. How would you handle such case?

There is a more generic way of solving this problem.

# 13. Roman to Integer(easy)

Easy

10242331FavoriteShare

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.

# 14. Longest Common Prefix(easy)

Easy

10391106FavoriteShare

Write a function to find the longest common prefix string amongst an array of strings.

If there is no common prefix, return an empty string "".

**Example 1:**

**Input:** ["flower","flow","flight"]

**Output:** "fl"

**Example 2:**

**Input:** ["dog","racecar","car"]

**Output:** ""

**Explanation:** There is no common prefix among the input strings.

**Note:**

All given inputs are in lowercase letters a-z.

# 20. Valid Parentheses(easy)

Easy

2371117FavoriteShare

Given a string containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.

An input string is valid if:

1. Open brackets must be closed by the same type of brackets.
2. Open brackets must be closed in the correct order.

Note that an empty string is also considered valid.

**Example 1:**

**Input:** "()"

**Output:** true

**Example 2:**

**Input:** "()[]{}"

**Output:** true

**Example 3:**

**Input:** "(]"

**Output:** false

**Example 4:**

**Input:** "([)]"

**Output:** false

**Example 5:**

**Input:** "{[]}"

**Output:** true

# 21. Merge Two Sorted Lists(easy)

Easy

1753240FavoriteShare

Merge two sorted linked lists and return it as a new list. The new list should be made by splicing together the nodes of the first two lists.

**Example:**

**Input:** 1->2->4, 1->3->4

**Output:** 1->1->2->3->4->4

# 26. Remove Duplicates from Sorted Array(easy)

Easy

12682647FavoriteShare

Given a sorted array nums, remove the duplicates [**in-place**](https://en.wikipedia.org/wiki/In-place_algorithm) such that each element appear only once and return the new length.

Do not allocate extra space for another array, you must do this by **modifying the input array**[**in-place**](https://en.wikipedia.org/wiki/In-place_algorithm) with O(1) extra memory.

**Example 1:**

Given nums = **[1,1,2]**,

Your function should return length = **2**, with the first two elements of *nums* being **1** and **2** respectively.

It doesn't matter what you leave beyond the returned length.

**Example 2:**

Given nums = **[0,0,1,1,1,2,2,3,3,4]**,

Your function should return length = **5**, with the first five elements of *nums* being modified to **0**, **1**, **2**, **3**, and **4** respectively.

It doesn't matter what values are set beyond the returned length.

**Clarification:**

Confused why the returned value is an integer but your answer is an array?

Note that the input array is passed in by **reference**, which means modification to the input array will be known to the caller as well.

Internally you can think of this:

// **nums** is passed in by reference. (i.e., without making a copy)

int len = removeDuplicates(nums);

// any modification to **nums** in your function would be known by the caller.

// using the length returned by your function, it prints the first **len** elements.

for (int i = 0; i < len; i++) {

    print(nums[i]);

}

# 27. Remove Element(easy)

Easy

6751466FavoriteShare

Given an array nums and a value val, remove all instances of that value [**in-place**](https://en.wikipedia.org/wiki/In-place_algorithm) and return the new length.

Do not allocate extra space for another array, you must do this by **modifying the input array**[**in-place**](https://en.wikipedia.org/wiki/In-place_algorithm) with O(1) extra memory.

The order of elements can be changed. It doesn't matter what you leave beyond the new length.

**Example 1:**

Given nums = **[3,2,2,3]**, val = **3**,

Your function should return length = **2**, with the first two elements of nums being **2**.

It doesn't matter what you leave beyond the returned length.

**Example 2:**

Given nums = **[0,1,2,2,3,0,4,2]**, val = **2**,

Your function should return length = **5**, with the first five elements of *nums* containing **0**, **1**, **3**, **0**, and **4**.

Note that the order of those five elements can be arbitrary.

It doesn't matter what values are set beyond the returned length.

**Clarification:**

Confused why the returned value is an integer but your answer is an array?

Note that the input array is passed in by **reference**, which means modification to the input array will be known to the caller as well.

Internally you can think of this:

// **nums** is passed in by reference. (i.e., without making a copy)

int len = removeElement(nums, val);

// any modification to **nums** in your function would be known by the caller.

// using the length returned by your function, it prints the first **len** elements.

for (int i = 0; i < len; i++) {

    print(nums[i]);

}

# 28. Implement strStr()(easy)

Easy

7241117FavoriteShare

Implement [strStr()](http://www.cplusplus.com/reference/cstring/strstr/" \t "_blank).

Return the index of the first occurrence of needle in haystack, or **-1** if needle is not part of haystack.

**Example 1:**

**Input:** haystack = "hello", needle = "ll"

**Output:** 2

**Example 2:**

**Input:** haystack = "aaaaa", needle = "bba"

**Output:** -1

**Clarification:**

What should we return when needle is an empty string? This is a great question to ask during an interview.

For the purpose of this problem, we will return 0 when needle is an empty string. This is consistent to C's [strstr()](http://www.cplusplus.com/reference/cstring/strstr/" \t "_blank) and Java's [indexOf()](https://docs.oracle.com/javase/7/docs/api/java/lang/String.html" \l "indexOf(java.lang.String)" \t "_blank).

Accepted

361,703

Submissions

1,172,841

# 35. Search Insert Position(easy)

Easy

1068154FavoriteShare

Given a sorted array and a target value, return the index if the target is found. If not, return the index where it would be if it were inserted in order.

You may assume no duplicates in the array.

**Example 1:**

**Input:** [1,3,5,6], 5

**Output:** 2

**Example 2:**

**Input:** [1,3,5,6], 2

**Output:** 1

**Example 3:**

**Input:** [1,3,5,6], 7

**Output:** 4

**Example 4:**

**Input:** [1,3,5,6], 0

**Output:** 0

# 38. Count and Say(easy)

Easy

6254420FavoriteShare

The count-and-say sequence is the sequence of integers with the first five terms as following:

1. 1

2. 11

3. 21

4. 1211

5. 111221

1 is read off as "one 1" or 11.  
11 is read off as "two 1s" or 21.  
21 is read off as "one 2, then one 1" or 1211.

Given an integer *n* where 1 ≤ *n* ≤ 30, generate the *n*th term of the count-and-say sequence.

Note: Each term of the sequence of integers will be represented as a string.

**Example 1:**

**Input:** 1

**Output:** "1"

**Example 2:**

**Input:** 4

**Output:** "1211"

# 53. Maximum Subarray(easy)

Easy

3394119FavoriteShare

Given an integer array nums, find the contiguous subarray (containing at least one number) which has the largest sum and return its sum.

**Example:**

**Input:** [-2,1,-3,4,-1,2,1,-5,4],

**Output:** 6

**Explanation:** [4,-1,2,1] has the largest sum = 6.

**Follow up:**

If you have figured out the O(*n*) solution, try coding another solution using the divide and conquer approach, which is more subtle.

就是一个最大子列和问题，用动态规划的思路解决~

# 58. Length of Last Word(easy)

Easy

3071237FavoriteShare

Given a string *s* consists of upper/lower-case alphabets and empty space characters ' ', return the length of last word in the string.

If the last word does not exist, return 0.

**Note:** A word is defined as a character sequence consists of non-space characters only.

**Example:**

**Input:** "Hello World"

**Output:** 5

# 66. Plus One(easy)

Easy

7141303FavoriteShare

Given a **non-empty** array of digits representing a non-negative integer, plus one to the integer.

The digits are stored such that the most significant digit is at the head of the list, and each element in the array contain a single digit.

You may assume the integer does not contain any leading zero, except the number 0 itself.

**Example 1:**

**Input:** [1,2,3]

**Output:** [1,2,4]

**Explanation:** The array represents the integer 123.

**Example 2:**

**Input:** [4,3,2,1]

**Output:** [4,3,2,2]

**Explanation:** The array represents the integer 4321.

# 67. Add Binary(easy)

Easy

784163FavoriteShare

Given two binary strings, return their sum (also a binary string).

The input strings are both **non-empty** and contains only characters 1 or 0.

**Example 1:**

**Input:** a = "11", b = "1"

**Output:** "100"

**Example 2:**

**Input:** a = "1010", b = "1011"

**Output:** "10101"

# 69. Sqrt(x)(easy)

Easy

6231151FavoriteShare

Implement int sqrt(int x).

Compute and return the square root of *x*, where *x* is guaranteed to be a non-negative integer.

Since the return type is an integer, the decimal digits are truncated and only the integer part of the result is returned.

**Example 1:**

**Input:** 4

**Output:** 2

**Example 2:**

**Input:** 8

**Output:** 2

**Explanation:** The square root of 8 is 2.82842..., and since

  the decimal part is truncated, 2 is returned.

注意int类型的表示范围可能导致溢出

# 70. Climbing Stairs(easy)

Easy

177167FavoriteShare

You are climbing a stair case. It takes *n* steps to reach to the top.

Each time you can either climb 1 or 2 steps. In how many distinct ways can you climb to the top?

**Note:** Given *n* will be a positive integer.

**Example 1:**

**Input:** 2

**Output:** 2

**Explanation:** There are two ways to climb to the top.

1. 1 step + 1 step

2. 2 steps

**Example 2:**

**Input:** 3

**Output:** 3

**Explanation:** There are three ways to climb to the top.

1. 1 step + 1 step + 1 step

2. 1 step + 2 steps

3. 2 steps + 1 step

本质就是个斐波那契

# 83. Remove Duplicates from Sorted List(easy)

Easy

65772FavoriteShare

Given a sorted linked list, delete all duplicates such that each element appear only *once*.

**Example 1:**

**Input:** 1->1->2

**Output:** 1->2

**Example 2:**

**Input:** 1->1->2->3->3

**Output:** 1->2->3

# 88. Merge Sorted Array(easy)

Easy

9392470FavoriteShare

Given two sorted integer arrays *nums1* and *nums2*, merge *nums2* into *nums1* as one sorted array.

**Note:**

* The number of elements initialized in *nums1* and *nums2* are *m* and *n* respectively.
* You may assume that *nums1* has enough space (size that is greater or equal to *m* + *n*) to hold additional elements from *nums2*.

**Example:**

**Input:**

nums1 = [1,2,3,0,0,0], m = 3

nums2 = [2,5,6], n = 3

**Output:** [1,2,2,3,5,6]

# 100. Same Tree(easy)

Easy

99931FavoriteShare

Given two binary trees, write a function to check if they are the same or not.

Two binary trees are considered the same if they are structurally identical and the nodes have the same value.

**Example 1:**

**Input:** 1 1

/ \ / \

2 3 2 3

[1,2,3], [1,2,3]

**Output:** true

**Example 2:**

**Input:** 1 1

/ \

2 2

[1,2], [1,null,2]

**Output:** false

**Example 3:**

**Input:** 1 1

/ \ / \

2 1 1 2

[1,2,1], [1,1,2]

**Output:** false

# 101. Symmetric Tree(easy)

Easy

190843FavoriteShare

Given a binary tree, check whether it is a mirror of itself (ie, symmetric around its center).

For example, this binary tree [1,2,2,3,4,4,3] is symmetric:

1

/ \

2 2

/ \ / \

3 4 4 3

But the following [1,2,2,null,3,null,3] is not:

1

/ \

2 2

\ \

3 3

**Note:**  
Bonus points if you could solve it both recursively and iteratively.

# 104. Maximum Depth of Binary Tree(easy)

Easy

113247FavoriteShare

Given a binary tree, find its maximum depth.

The maximum depth is the number of nodes along the longest path from the root node down to the farthest leaf node.

**Note:** A leaf is a node with no children.

**Example:**

Given binary tree [3,9,20,null,null,15,7],

3

/ \

9 20

/ \

15 7

return its depth = 3.

# 107. Binary Tree Level Order Traversal II(easy)

Easy

639113FavoriteShare

Given a binary tree, return the *bottom-up level order* traversal of its nodes' values. (ie, from left to right, level by level from leaf to root).

For example:  
Given binary tree [3,9,20,null,null,15,7],

3

/ \

9 20

/ \

15 7

return its bottom-up level order traversal as:

[

[15,7],

[9,20],

[3]

]

# 108. Convert Sorted Array to Binary Search Tree(easy)

Easy

97599FavoriteShare

Given an array where elements are sorted in ascending order, convert it to a height balanced BST.

For this problem, a height-balanced binary tree is defined as a binary tree in which the depth of the two subtrees of *every* node never differ by more than 1.

**Example:**

Given the sorted array: [-10,-3,0,5,9],

One possible answer is: [0,-3,9,-10,null,5], which represents the following height balanced BST:

0

/ \

-3 9

/ /

-10 5

# 110. Balanced Binary Tree(easy)

Easy

106492FavoriteShare

Given a binary tree, determine if it is height-balanced.

For this problem, a height-balanced binary tree is defined as:

a binary tree in which the depth of the two subtrees of *every* node never differ by more than 1.

**Example 1:**

Given the following tree [3,9,20,null,null,15,7]:

3

/ \

9 20

/ \

15 7

Return true.  
  
**Example 2:**

Given the following tree [1,2,2,3,3,null,null,4,4]:

1

/ \

2 2

/ \

3 3

/ \

4 4

Return false.

# 111. Minimum Depth of Binary Tree(easy)

Easy

644322FavoriteShare

Given a binary tree, find its minimum depth.

The minimum depth is the number of nodes along the shortest path from the root node down to the nearest leaf node.

**Note:** A leaf is a node with no children.

**Example:**

Given binary tree [3,9,20,null,null,15,7],

3

/ \

9 20

/ \

15 7

return its minimum depth = 2.

# 112. Path Sum(easy)

Easy

806261FavoriteShare

Given a binary tree and a sum, determine if the tree has a root-to-leaf path such that adding up all the values along the path equals the given sum.

**Note:** A leaf is a node with no children.

**Example:**

Given the below binary tree and sum = 22,

**5**

**/** \

**4** 8

**/** / \

**11** 13 4

/ **\** \

7 **2** 1

return true, as there exist a root-to-leaf path 5->4->11->2 which sum is 22.

# 118. Pascal's Triangle(easy)

Easy

62072FavoriteShare

Given a non-negative integer *numRows*, generate the first *numRows* of Pascal's triangle.

  
In Pascal's triangle, each number is the sum of the two numbers directly above it.

**Example:**

**Input:** 5

**Output:**

[

[1],

[1,1],

[1,2,1],

[1,3,3,1],

[1,4,6,4,1]

]

# 119. Pascal's Triangle II(easy)

Easy

419153FavoriteShare

Given a non-negative index *k* where *k* ≤ 33, return the *k*th index row of the Pascal's triangle.

Note that the row index starts from 0.

  
In Pascal's triangle, each number is the sum of the two numbers directly above it.

**Example:**

**Input:** 3

**Output:** [1,3,3,1]

**Follow up:**

Could you optimize your algorithm to use only *O*(*k*) extra space?

# 121. Best Time to Buy and Sell Stock(easy)

Easy

2273113FavoriteShare

Say you have an array for which the *i*th element is the price of a given stock on day *i*.

If you were only permitted to complete at most one transaction (i.e., buy one and sell one share of the stock), design an algorithm to find the maximum profit.

Note that you cannot sell a stock before you buy one.

**Example 1:**

**Input:** [7,1,5,3,6,4]

**Output:** 5

**Explanation:** Buy on day 2 (price = 1) and sell on day 5 (price = 6), profit = 6-1 = 5.

  Not 7-1 = 6, as selling price needs to be larger than buying price.

**Example 2:**

**Input:** [7,6,4,3,1]

**Output:** 0

**Explanation:** In this case, no transaction is done, i.e. max profit = 0.

# 122. Best Time to Buy and Sell Stock II(easy)

Easy

8631211FavoriteShare

Say you have an array for which the *i*th element is the price of a given stock on day *i*.

Design an algorithm to find the maximum profit. You may complete as many transactions as you like (i.e., buy one and sell one share of the stock multiple times).

**Note:** You may not engage in multiple transactions at the same time (i.e., you must sell the stock before you buy again).

**Example 1:**

**Input:** [7,1,5,3,6,4]

**Output:** 7

**Explanation:** Buy on day 2 (price = 1) and sell on day 3 (price = 5), profit = 5-1 = 4.

  Then buy on day 4 (price = 3) and sell on day 5 (price = 6), profit = 6-3 = 3.

**Example 2:**

**Input:** [1,2,3,4,5]

**Output:** 4

**Explanation:** Buy on day 1 (price = 1) and sell on day 5 (price = 5), profit = 5-1 = 4.

  Note that you cannot buy on day 1, buy on day 2 and sell them later, as you are

  engaging multiple transactions at the same time. You must sell before buying again.

**Example 3:**

**Input:** [7,6,4,3,1]

**Output:** 0

**Explanation:** In this case, no transaction is done, i.e. max profit = 0.

# 125. Valid Palindrome(easy)

Easy

5401519FavoriteShare

Given a string, determine if it is a palindrome, considering only alphanumeric characters and ignoring cases.

**Note:** For the purpose of this problem, we define empty string as valid palindrome.

**Example 1:**

**Input:** "A man, a plan, a canal: Panama"

**Output:** true

**Example 2:**

**Input:** "race a car"

**Output:** false

# 136. Single Number(easy)

Easy

221183FavoriteShare

Given a **non-empty** array of integers, every element appears *twice* except for one. Find that single one.

**Note:**

Your algorithm should have a linear runtime complexity. Could you implement it without using extra memory?

**Example 1:**

**Input:** [2,2,1]

**Output:** 1

**Example 2:**

**Input:** [4,1,2,1,2]

**Output:** 4

# 141. Linked List Cycle(easy)

Easy

1410139FavoriteShare

Given a linked list, determine if it has a cycle in it.

To represent a cycle in the given linked list, we use an integer pos which represents the position (0-indexed) in the linked list where tail connects to. If pos is -1, then there is no cycle in the linked list.

**Example 1:**

**Input:** head = [3,2,0,-4], pos = 1

**Output:** true

**Explanation:** There is a cycle in the linked list, where tail connects to the second node.



**Example 2:**

**Input:** head = [1,2], pos = 0

**Output:** true

**Explanation:** There is a cycle in the linked list, where tail connects to the first node.



**Example 3:**

**Input:** head = [1], pos = -1

**Output:** false

**Explanation:** There is no cycle in the linked list.



**Follow up:**

Can you solve it using *O(1)* (i.e. constant) memory?

# 155. Min Stack(easy)

Easy

1647172FavoriteShare

Design a stack that supports push, pop, top, and retrieving the minimum element in constant time.

* push(x) -- Push element x onto stack.
* pop() -- Removes the element on top of the stack.
* top() -- Get the top element.
* getMin() -- Retrieve the minimum element in the stack.

**Example:**

MinStack minStack = new MinStack();

minStack.push(-2);

minStack.push(0);

minStack.push(-3);

minStack.getMin(); --> Returns -3.

minStack.pop();

minStack.top(); --> Returns 0.

minStack.getMin(); --> Returns -2.

# 167. Two Sum II - Input array is sorted(easy)

Easy

839356FavoriteShare

Given an array of integers that is already ***sorted in ascending order***, find two numbers such that they add up to a specific target number.

The function twoSum should return indices of the two numbers such that they add up to the target, where index1 must be less than index2.

**Note:**

* Your returned answers (both index1 and index2) are not zero-based.
* You may assume that each input would have *exactly* one solution and you may not use the *same* element twice.

**Example:**

**Input:** numbers = [2,7,11,15], target = 9

**Output:** [1,2]

**Explanation:** The sum of 2 and 7 is 9. Therefore index1 = 1, index2 = 2.

# 168. Excel Sheet Column Title(easy)

Easy

678132FavoriteShare

Given a positive integer, return its corresponding column title as appear in an Excel sheet.

For example:

1 -> A

2 -> B

3 -> C

...

26 -> Z

27 -> AA

28 -> AB

...

**Example 1:**

**Input:** 1

**Output:** "A"

**Example 2:**

**Input:** 28

**Output:** "AB"

**Example 3:**

**Input:** 701

**Output:** "ZY"

# 169. Majority Element(easy)

Easy

1545136FavoriteShare

Given an array of size *n*, find the majority element. The majority element is the element that appears **more than** ⌊ n/2 ⌋ times.

You may assume that the array is non-empty and the majority element always exist in the array.

**Example 1:**

**Input:** [3,2,3]

**Output:** 3

**Example 2:**

**Input:** [2,2,1,1,1,2,2]

**Output:** 2

# 171. Excel Sheet Column Number(easy)

Easy

51693FavoriteShare

Given a column title as appear in an Excel sheet, return its corresponding column number.

For example:

A -> 1

B -> 2

C -> 3

...

Z -> 26

AA -> 27

AB -> 28

...

**Example 1:**

**Input:** "A"

**Output:** 1

**Example 2:**

**Input:** "AB"

**Output:** 28

**Example 3:**

**Input:** "ZY"

**Output:** 701

# 172. Factorial Trailing Zeroes(easy)

Easy

459657FavoriteShare

Given an integer *n*, return the number of trailing zeroes in *n*!.

**Example 1:**

**Input:** 3

**Output:** 0

**Explanation:** 3! = 6, no trailing zero.

**Example 2:**

**Input:** 5

**Output:** 1

**Explanation:** 5! = 120, one trailing zero.

**Note:**Your solution should be in logarithmic time complexity.

# 175. Combine Two Tables(easy)

Easy

67295FavoriteShare

SQL Schema

Table: Person

+-------------+---------+

| Column Name | Type |

+-------------+---------+

| PersonId | int |

| FirstName | varchar |

| LastName | varchar |

+-------------+---------+

PersonId is the primary key column for this table.

Table: Address

+-------------+---------+

| Column Name | Type |

+-------------+---------+

| AddressId | int |

| PersonId | int |

| City | varchar |

| State | varchar |

+-------------+---------+

AddressId is the primary key column for this table.

Write a SQL query for a report that provides the following information for each person in the Person table, regardless if there is an address for each of those people:

FirstName, LastName, City, State

# 176. Second Highest Salary(easy)

Easy

518270FavoriteShare

SQL Schema

Write a SQL query to get the second highest salary from the Employee table.

+----+--------+

| Id | Salary |

+----+--------+

| 1 | 100 |

| 2 | 200 |

| 3 | 300 |

+----+--------+

For example, given the above Employee table, the query should return 200 as the second highest salary. If there is no second highest salary, then the query should return null.

+---------------------+

| SecondHighestSalary |

+---------------------+

| 200 |

+---------------------+

# 181. Employees Earning More Than Their Managers(easy)

Easy

37142FavoriteShare

SQL Schema

The Employee table holds all employees including their managers. Every employee has an Id, and there is also a column for the manager Id.

+----+-------+--------+-----------+

| Id | Name | Salary | ManagerId |

+----+-------+--------+-----------+

| 1 | Joe | 70000 | 3 |

| 2 | Henry | 80000 | 4 |

| 3 | Sam | 60000 | NULL |

| 4 | Max | 90000 | NULL |

+----+-------+--------+-----------+

Given the Employee table, write a SQL query that finds out employees who earn more than their managers. For the above table, Joe is the only employee who earns more than his manager.

+----------+

| Employee |

+----------+

| Joe |

+----------+

# 182. Duplicate Emails(easy)

Easy

29918FavoriteShare

SQL Schema

Write a SQL query to find all duplicate emails in a table named Person.

+----+---------+

| Id | Email |

+----+---------+

| 1 | a@b.com |

| 2 | c@d.com |

| 3 | a@b.com |

+----+---------+

For example, your query should return the following for the above table:

+---------+

| Email |

+---------+

| a@b.com |

+---------+

**Note**: All emails are in lowercase.

# 183. Customers Who Never Order(easy)

Easy

25632FavoriteShare

SQL Schema

Suppose that a website contains two tables, the Customers table and the Orders table. Write a SQL query to find all customers who never order anything.

Table: Customers.

+----+-------+

| Id | Name |

+----+-------+

| 1 | Joe |

| 2 | Henry |

| 3 | Sam |

| 4 | Max |

+----+-------+

Table: Orders.

+----+------------+

| Id | CustomerId |

+----+------------+

| 1 | 3 |

| 2 | 1 |

+----+------------+

Using the above tables as example, return the following:

+-----------+

| Customers |

+-----------+

| Henry |

| Max |

+-----------+

# 189. Rotate Array(easy)

Easy

1443619FavoriteShare

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?

# 190. Reverse Bits(easy)

Easy

589197FavoriteShare

Reverse bits of a given 32 bits unsigned integer.

**Example 1:**

**Input:** 00000010100101000001111010011100

**Output:** 00111001011110000010100101000000

**Explanation:** The input binary string **00000010100101000001111010011100** represents the unsigned integer 43261596, so return 964176192 which its binary representation is **00111001011110000010100101000000**.

**Example 2:**

**Input:** 11111111111111111111111111111101

**Output:** 10111111111111111111111111111111

**Explanation:** The input binary string **11111111111111111111111111111101** represents the unsigned integer 4294967293, so return 3221225471 which its binary representation is **10101111110010110010011101101001**.

**Note:**

* Note that in some languages such as Java, there is no unsigned integer type. In this case, both input and output will be given as signed integer type and should not affect your implementation, as the internal binary representation of the integer is the same whether it is signed or unsigned.
* In Java, the compiler represents the signed integers using [2's complement notation](https://en.wikipedia.org/wiki/Two%27s_complement). Therefore, in **Example 2** above the input represents the signed integer -3 and the output represents the signed integer -1073741825.

**Follow up**:

If this function is called many times, how would you optimize it?

# 191. Number of 1 Bits(easy)

Easy

475402FavoriteShare

Write a function that takes an unsigned integer and return the number of '1' bits it has (also known as the [Hamming weight](http://en.wikipedia.org/wiki/Hamming_weight)).

**Example 1:**

**Input:** 00000000000000000000000000001011

**Output:** 3

**Explanation:** The input binary string **00000000000000000000000000001011** has a total of three '1' bits.

**Example 2:**

**Input:** 00000000000000000000000010000000

**Output:** 1

**Explanation:** The input binary string **00000000000000000000000010000000** has a total of one '1' bit.

**Example 3:**

**Input:** 11111111111111111111111111111101

**Output:** 31

**Explanation:** The input binary string **11111111111111111111111111111101** has a total of thirty one '1' bits.

**Note:**

* Note that in some languages such as Java, there is no unsigned integer type. In this case, the input will be given as signed integer type and should not affect your implementation, as the internal binary representation of the integer is the same whether it is signed or unsigned.
* In Java, the compiler represents the signed integers using [2's complement notation](https://en.wikipedia.org/wiki/Two%27s_complement). Therefore, in **Example 3** above the input represents the signed integer -3.

**Follow up**:

If this function is called many times, how would you optimize it?

# 193. Valid Phone Numbers(easy)

Easy

101247FavoriteShare

Given a text file file.txt that contains list of phone numbers (one per line), write a one liner bash script to print all valid phone numbers.

You may assume that a valid phone number must appear in one of the following two formats: (xxx) xxx-xxxx or xxx-xxx-xxxx. (x means a digit)

You may also assume each line in the text file must not contain leading or trailing white spaces.

**Example:**

Assume that file.txt has the following content:

987-123-4567

123 456 7890

(123) 456-7890

Your script should output the following valid phone numbers:

987-123-4567

(123) 456-7890

# 195. Tenth Line(easy)

Easy

127112FavoriteShare

Given a text file file.txt, print just the 10th line of the file.

**Example:**

Assume that file.txt has the following content:

Line 1

Line 2

Line 3

Line 4

Line 5

Line 6

Line 7

Line 8

Line 9

Line 10

Your script should output the tenth line, which is:

Line 10

**Note:**  
1. If the file contains less than 10 lines, what should you output?  
2. There's at least three different solutions. Try to explore all possibilities.

# 196. Delete Duplicate Emails(easy)

Easy

289351FavoriteShare

Write a SQL query to **delete** all duplicate email entries in a table named Person, keeping only unique emails based on its *smallest* **Id**.

+----+------------------+

| Id | Email |

+----+------------------+

| 1 | john@example.com |

| 2 | bob@example.com |

| 3 | john@example.com |

+----+------------------+

Id is the primary key column for this table.

For example, after running your query, the above Person table should have the following rows:

+----+------------------+

| Id | Email |

+----+------------------+

| 1 | john@example.com |

| 2 | bob@example.com |

+----+------------------+

**Note:**

Your output is the whole Person table after executing your sql. Use delete statement.

# 197. Rising Temperature(easy)

Easy

263109FavoriteShare

SQL Schema

Given a Weather table, write a SQL query to find all dates' Ids with higher temperature compared to its previous (yesterday's) dates.

+---------+------------------+------------------+

| Id(INT) | RecordDate(DATE) | Temperature(INT) |

+---------+------------------+------------------+

| 1 | 2015-01-01 | 10 |

| 2 | 2015-01-02 | 25 |

| 3 | 2015-01-03 | 20 |

| 4 | 2015-01-04 | 30 |

+---------+------------------+------------------+

For example, return the following Ids for the above Weather table:

+----+

| Id |

+----+

| 2 |

| 4 |

+----+

# 198. House Robber(easy)

Easy

279987FavoriteShare

You are a professional robber planning to rob houses along a street. Each house has a certain amount of money stashed, the only constraint stopping you from robbing each of them is that adjacent houses have security system connected and **it will automatically contact the police if two adjacent houses were broken into on the same night**.

Given a list of non-negative integers representing the amount of money of each house, determine the maximum amount of money you can rob tonight **without alerting the police**.

**Example 1:**

**Input:** [1,2,3,1]

**Output:** 4

**Explanation:** Rob house 1 (money = 1) and then rob house 3 (money = 3).

  Total amount you can rob = 1 + 3 = 4.

**Example 2:**

**Input:** [2,7,9,3,1]

**Output:** 12

**Explanation:** Rob house 1 (money = 2), rob house 3 (money = 9) and rob house 5 (money = 1).

  Total amount you can rob = 2 + 9 + 1 = 12.

# 202. Happy Number(easy)

Easy

952248FavoriteShare

Write an algorithm to determine if a number 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.

**Example:**

**Input:** 19

**Output:** true

**Explanation:**

12 + 92 = 82

82 + 22 = 68

62 + 82 = 100

12 + 02 + 02 = 1

# 203. Remove Linked List Elements(easy)

Easy

91557FavoriteShare

Remove all elements from a linked list of integers that have value ***val***.

**Example:**

**Input:** 1->2->6->3->4->5->6, ***val*** = 6

**Output:** 1->2->3->4->5

# 204. Count Primes(easy)

Easy

1203432FavoriteShare

Count the number of prime numbers less than a non-negative number, ***n***.

**Example:**

**Input:** 10

**Output:** 4

**Explanation:** There are 4 prime numbers less than 10, they are 2, 3, 5, 7.

# 205. Isomorphic Strings(easy)

Easy

829240FavoriteShare

Given two strings ***s*** and ***t***, determine if they are isomorphic.

Two strings are isomorphic if the characters in ***s*** can be replaced to get ***t***.

All occurrences of a character must be replaced with another character while preserving the order of characters. No two characters may map to the same character but a character may map to itself.

**Example 1:**

**Input:** ***s*** = "egg", ***t =*** "add"

**Output:** true

**Example 2:**

**Input:** ***s*** = "foo", ***t =*** "bar"

**Output:** false

**Example 3:**

**Input:** ***s*** = "paper", ***t =*** "title"

**Output:** true

**Note:**  
You may assume both ***s***and ***t***have the same length.

# 206. Reverse Linked List(easy)

Easy

265169FavoriteShare

Reverse a singly linked list.

**Example:**

**Input:** 1->2->3->4->5->NULL

**Output:** 5->4->3->2->1->NULL

**Follow up:**

A linked list can be reversed either iteratively or recursively. Could you implement both?

# 217. Contains Duplicate(easy)

Easy

452558FavoriteShare

Given an array of integers, find if the array contains any duplicates.

Your function should return true if any value appears at least twice in the array, and it should return false if every element is distinct.

**Example 1:**

**Input:** [1,2,3,1]

**Output:** true

**Example 2:**

**Input:** [1,2,3,4]

**Output:** false

**Example 3:**

**Input:** [1,1,1,3,3,4,3,2,4,2]

**Output:** true

# 219. Contains Duplicate II(easy)

Easy

553678FavoriteShare

Given an array of integers and an integer *k*, find out whether there are two distinct indices *i* and *j* in the array such that **nums[i] = nums[j]** and the **absolute** difference between *i*and *j* is at most *k*.

**Example 1:**

**Input:** nums = [1,2,3,1], k = 3

**Output:** true

**Example 2:**

**Input:** nums = [1,0,1,1], k = 1

**Output:** true

**Example 3:**

**Input:** nums = [1,2,3,1,2,3], k = 2

**Output:** false

# 225. Implement Stack using Queues(easy)

Easy

373454FavoriteShare

Implement the following operations of a stack using queues.

* push(x) -- Push element x onto stack.
* pop() -- Removes the element on top of the stack.
* top() -- Get the top element.
* empty() -- Return whether the stack is empty.

**Example:**

MyStack stack = new MyStack();

stack.push(1);

stack.push(2);

stack.top(); // returns 2

stack.pop(); // returns 2

stack.empty(); // returns false

**Notes:**

* You must use *only* standard operations of a queue -- which means only push to back, peek/pop from front, size, and is empty operations are valid.
* Depending on your language, queue may not be supported natively. You may simulate a queue by using a list or deque (double-ended queue), as long as you use only standard operations of a queue.
* You may assume that all operations are valid (for example, no pop or top operations will be called on an empty stack).

# 226. Invert Binary Tree(easy)

Easy

193432FavoriteShare

Invert a binary tree.

**Example:**

Input:

4

/ \

2 7

/ \ / \

1 3 6 9

Output:

4

/ \

7 2

/ \ / \

9 6 3 1

**Trivia:**  
This problem was inspired by [this original tweet](https://twitter.com/mxcl/status/608682016205344768) by [Max Howell](https://twitter.com/mxcl):

Google: 90% of our engineers use the software you wrote (Homebrew), but you can’t invert a binary tree on a whiteboard so f\*\*\* off.

# 231. Power of Two(easy)

Easy

487136FavoriteShare

Given an integer, write a function to determine if it is a power of two.

**Example 1:**

**Input:** 1

**Output:** true

**Explanation:** 20 = 1

**Example 2:**

**Input:** 16

**Output:** true

**Explanation:** 24 = 16

**Example 3:**

**Input:** 218

**Output:** false

# 232. Implement Queue using Stacks(easy)

Easy

638114FavoriteShare

Implement the following operations of a queue using stacks.

* push(x) -- Push element x to the back of queue.
* pop() -- Removes the element from in front of queue.
* peek() -- Get the front element.
* empty() -- Return whether the queue is empty.

**Example:**

MyQueue queue = new MyQueue();

queue.push(1);

queue.push(2);

queue.peek(); // returns 1

queue.pop(); // returns 1

queue.empty(); // returns false

**Notes:**

* You must use *only* standard operations of a stack -- which means only push to top, peek/pop from top, size, and is empty operations are valid.
* Depending on your language, stack may not be supported natively. You may simulate a stack by using a list or deque (double-ended queue), as long as you use only standard operations of a stack.
* You may assume that all operations are valid (for example, no pop or peek operations will be called on an empty queue).

# 235. Lowest Common Ancestor of a Binary Search Tree(easy)

Easy

122288FavoriteShare

Given a binary search tree (BST), find the lowest common ancestor (LCA) of two given nodes in the BST.

According to the [definition of LCA on Wikipedia](https://en.wikipedia.org/wiki/Lowest_common_ancestor): “The lowest common ancestor is defined between two nodes p and q as the lowest node in T that has both p and q as descendants (where we allow **a node to be a descendant of itself**).”

Given binary search tree:  root = [6,2,8,0,4,7,9,null,null,3,5]



**Example 1:**

**Input:** root = [6,2,8,0,4,7,9,null,null,3,5], p = 2, q = 8

**Output:** 6

**Explanation:** The LCA of nodes 2 and 8 is 6.

**Example 2:**

**Input:** root = [6,2,8,0,4,7,9,null,null,3,5], p = 2, q = 4

**Output:** 2

**Explanation:** The LCA of nodes 2 and 4 is 2, since a node can be a descendant of itself according to the LCA definition.

**Note:**

* All of the nodes' values will be unique.
* p and q are different and both values will exist in the BST.

# 237. Delete Node in a Linked List(easy)

Easy

8544087FavoriteShare

Write a function to delete a node (except the tail) in a singly linked list, given only access to that node.

Given linked list -- head = [4,5,1,9], which looks like following:



**Example 1:**

**Input:** head = [4,5,1,9], node = 5

**Output:** [4,1,9]

**Explanation:** You are given the second node with value 5, the linked list should become 4 -> 1 -> 9 after calling your function.

**Example 2:**

**Input:** head = [4,5,1,9], node = 1

**Output:** [4,5,9]

**Explanation:** You are given the third node with value 1, the linked list should become 4 -> 5 -> 9 after calling your function.

**Note:**

* The linked list will have at least two elements.
* All of the nodes' values will be unique.
* The given node will not be the tail and it will always be a valid node of the linked list.
* Do not return anything from your function.

# 242. Valid Anagram(easy)

Easy

814116FavoriteShare

Given two strings *s* and *t*, write a function to determine if *t* is an anagram of *s*.

**Example 1:**

**Input:** *s* = "anagram", *t* = "nagaram"

**Output:** true

**Example 2:**

**Input:** *s* = "rat", *t* = "car"

**Output:** false

**Note:**  
You may assume the string contains only lowercase alphabets.

**Follow up:**  
What if the inputs contain unicode characters? How would you adapt your solution to such case?

# 257. Binary Tree Paths(easy)

Easy

99576FavoriteShare

Given a binary tree, return all root-to-leaf paths.

**Note:** A leaf is a node with no children.

**Example:**

**Input:**

1

/ \

2 3

\

5

**Output:** ["1->2->5", "1->3"]

**Explanation:** All root-to-leaf paths are: 1->2->5, 1->3

# 258. Add Digits(easy)

Easy

503837FavoriteShare

Given a non-negative integer num, repeatedly add all its digits until the result has only one digit.

**Example:**

**Input:** 38

**Output:** 2

**Explanation:** The process is like: 3 + 8 = 11, 1 + 1 = 2.

  Since 2 has only one digit, return it.

**Follow up:**  
Could you do it without any loop/recursion in O(1) runtime?

# 263. Ugly Number(easy)

Easy

264479FavoriteShare

Write a program to check whether a given number is an ugly number.

Ugly numbers are **positive numbers** whose prime factors only include 2, 3, 5.

**Example 1:**

**Input:** 6

**Output:** true

**Explanation:** 6 = 2 × 3

**Example 2:**

**Input:** 8

**Output:** true

**Explanation:** 8 = 2 × 2 × 2

**Example 3:**

**Input:** 14

**Output:** false

**Explanation:** 14 is not ugly since it includes another prime factor 7.

**Note:**

1. 1 is typically treated as an ugly number.
2. Input is within the 32-bit signed integer range: [−231,  231− 1].

# 268. Missing Number(easy)

Easy

10711462FavoriteShare

Given an array containing *n* distinct numbers taken from 0, 1, 2, ..., n, find the one that is missing from the array.

**Example 1:**

**Input:** [3,0,1]

**Output:** 2

**Example 2:**

**Input:** [9,6,4,2,3,5,7,0,1]

**Output:** 8

**Note**:  
Your algorithm should run in linear runtime complexity. Could you implement it using only constant extra space complexity?

# 278. First Bad Version(easy)

Easy

739453FavoriteShare

You are a product manager and currently leading a team to develop a new product. Unfortunately, the latest version of your product fails the quality check. Since each version is developed based on the previous version, all the versions after a bad version are also bad.

Suppose you have n versions [1, 2, ..., n] and you want to find out the first bad one, which causes all the following ones to be bad.

You are given an API bool isBadVersion(version) which will return whether version is bad. Implement a function to find the first bad version. You should minimize the number of calls to the API.

**Example:**

Given n = 5, and version = 4 is the first bad version.

call isBadVersion(3) -> false

call isBadVersion(5) -> true

call isBadVersion(4) -> true

Then 4 is the first bad version.

# 283. Move Zeroes(easy)

Easy

231983FavoriteShare

Given an array nums, write a function to move all 0's to the end of it while maintaining the relative order of the non-zero elements.

**Example:**

**Input:** [0,1,0,3,12]

**Output:** [1,3,12,0,0]

**Note**:

1. You must do this **in-place** without making a copy of the array.
2. Minimize the total number of operations.

# 290. Word Pattern(easy)

Easy

73093FavoriteShare

Given a pattern and a string str, find if str follows the same pattern.

Here **follow** means a full match, such that there is a bijection between a letter in pattern and a **non-empty** word in str.

**Example 1:**

**Input:** pattern = "abba", str = "dog cat cat dog"

**Output:** true

**Example 2:**

**Input:**pattern = "abba", str = "dog cat cat fish"

**Output:** false

**Example 3:**

**Input:** pattern = "aaaa", str = "dog cat cat dog"

**Output:** false

**Example 4:**

**Input:** pattern = "abba", str = "dog dog dog dog"

**Output:** false

**Notes:**  
You may assume pattern contains only lowercase letters, and strcontains lowercase letters that may be separated by a single space.

# 292. Nim Game(easy)

Easy

4071217FavoriteShare

You are playing the following Nim Game with your friend: There is a heap of stones on the table, each time one of you take turns to remove 1 to 3 stones. The one who removes the last stone will be the winner. You will take the first turn to remove the stones.

Both of you are very clever and have optimal strategies for the game. Write a function to determine whether you can win the game given the number of stones in the heap.

**Example:**

**Input:** 4

**Output:** false

**Explanation:** If there are 4 stones in the heap, then you will never win the game;

  No matter 1, 2, or 3 stones you remove, the last stone will always be

  removed by your friend.

# 299. Bulls and Cows(easy)

Easy

386404FavoriteShare

You are playing the following [Bulls and Cows](https://en.wikipedia.org/wiki/Bulls_and_Cows) game with your friend: You write down a number and ask your friend to guess what the number is. Each time your friend makes a guess, you provide a hint that indicates how many digits in said guess match your secret number exactly in both digit and position (called "bulls") and how many digits match the secret number but locate in the wrong position (called "cows"). Your friend will use successive guesses and hints to eventually derive the secret number.

Write a function to return a hint according to the secret number and friend's guess, use A to indicate the bulls and B to indicate the cows.

Please note that both secret number and friend's guess may contain duplicate digits.

**Example 1:**

**Input:** secret = "1807", guess = "7810"

**Output:** "1A3B"

**Explanation:** 1 bull and 3 cows. The bull is 8, the cows are 0, 1 and 7.

**Example 2:**

**Input:** secret = "1123", guess = "0111"

**Output:** "1A1B"

**Explanation:** The 1st 1 in friend's guess is a bull, the 2nd or 3rd 1 is a cow.

**Note:**You may assume that the secret number and your friend's guess only contain digits, and their lengths are always equal.

# 303. Range Sum Query – Immutable(easy)

Easy

537837FavoriteShare

Given an integer array *nums*, find the sum of the elements between indices *i*and *j* (*i* ≤ *j*), inclusive.

**Example:**

Given nums = [-2, 0, 3, -5, 2, -1]

sumRange(0, 2) -> 1

sumRange(2, 5) -> -1

sumRange(0, 5) -> -3

**Note:**

1. You may assume that the array does not change.
2. There are many calls to *sumRange* function.

# 326. Power of Three(easy)

Easy

3241153FavoriteShare

Given an integer, write a function to determine if it is a power of three.

**Example 1:**

**Input:** 27

**Output:** true

**Example 2:**

**Input:** 0

**Output:** false

**Example 3:**

**Input:** 9

**Output:** true

**Example 4:**

**Input:** 45

**Output:** false

**Follow up:**  
Could you do it without using any loop / recursion?

# 342. Power of Four(easy)

Easy

341158FavoriteShare

Given an integer (signed 32 bits), write a function to check whether it is a power of 4.

**Example 1:**

**Input:** 16

**Output:** true

**Example 2:**

**Input:** 5

**Output:** false

**Follow up**: Could you solve it without loops/recursion?

# 344. Reverse String(easy)

Easy

863559FavoriteShare

Write a function that reverses a string. The input string is given as an array of characters char[].

Do not allocate extra space for another array, you must do this by **modifying the input array**[**in-place**](https://en.wikipedia.org/wiki/In-place_algorithm) with O(1) extra memory.

You may assume all the characters consist of [printable ascii characters](https://en.wikipedia.org/wiki/ASCII#Printable_characters).

**Example 1:**

**Input:** ["h","e","l","l","o"]

**Output:** ["o","l","l","e","h"]

**Example 2:**

**Input:** ["H","a","n","n","a","h"]

**Output:** ["h","a","n","n","a","H"]

# 345. Reverse Vowels of a String(easy)

Easy

433818FavoriteShare

Write a function that takes a string as input and reverse only the vowels of a string.

**Example 1:**

**Input:** "hello"

**Output:** "holle"

**Example 2:**

**Input:** "leetcode"

**Output:** "leotcede"

**Note:**  
The vowels does not include the letter "y".

# 349. Intersection of Two Arrays(easy)

Easy

470881FavoriteShare

Given two arrays, write a function to compute their intersection.

**Example 1:**

**Input:** nums1 = [1,2,2,1], nums2 = [2,2]

**Output:** [2]

**Example 2:**

**Input:** nums1 = [4,9,5], nums2 = [9,4,9,8,4]

**Output:** [9,4]

**Note:**

* Each element in the result must be unique.
* The result can be in any order.

# 350. Intersection of Two Arrays II(easy)

Easy

809287FavoriteShare

Given two arrays, write a function to compute their intersection.

**Example 1:**

**Input:** nums1 = [1,2,2,1], nums2 = [2,2]

**Output:** [2,2]

**Example 2:**

**Input:** nums1 = [4,9,5], nums2 = [9,4,9,8,4]

**Output:** [4,9]

**Note:**

* Each element in the result should appear as many times as it shows in both arrays.
* The result can be in any order.

**Follow up:**

* What if the given array is already sorted? How would you optimize your algorithm?
* What if *nums1*'s size is small compared to *nums2*'s size? Which algorithm is better?
* What if elements of *nums2* are stored on disk, and the memory is limited such that you cannot load all elements into the memory at once?