**Day 07-1389, 2006, 2418, 804, 1588.**

**35. Problem: 1389. Create Target Array in the Given Order.**

Given two arrays of integers nums and index. Your task is to create *target* array under the following rules:

Initially *target* array is empty.

From left to right read nums[i] and index[i], insert at index index[i] the value nums[i] in *target* array.

Repeat the previous step until there are no elements to read in nums and index.

Return the *target* array.

It is guaranteed that the insertion operations will be valid.

Example 1:

Input: nums = [0,1,2,3,4], index = [0,1,2,2,1]

Output: [0,4,1,3,2]

Explanation:

nums index target

0 0 [0]

1 1 [0,1]

2 2 [0,1,2]

3 2 [0,1,3,2]

4 1 [0,4,1,3,2]

Example 2:

Input: nums = [1,2,3,4,0], index = [0,1,2,3,0]

Output: [0,1,2,3,4]

Explanation:

nums index target

1 0 [1]

2 1 [1,2]

3 2 [1,2,3]

4 3 [1,2,3,4]

0 0 [0,1,2,3,4]

Example 3:

Input: nums = [1], index = [0]

Output: [1]

Constraints:

1 <= nums.length, index.length <= 100

nums.length == index.length

0 <= nums[i] <= 100

0 <= index[i] <= i

**Solution:**

**My Solution:**

class Solution\_1389 {  
 public int[] createTargetArray(int[] nums, int[] index) {  
 List<Integer> list = new ArrayList<>();  
 for (int i = 0; i < index.length; i++) {  
 list.add(index[i], nums[i]);  
 }  
 int[] array = new int[list.size()];  
 for (int i = 0; i < list.size(); i++) {  
 array[i] = list.get(i);  
 }  
 return array;  
 }  
}  
  
// <https://leetcode.com/problems/create-target-array-in-the-given-order/>

**Another Solution: 01**

class Solution {  
 public int[] createTargetArray(int[] nums, int[] index) {  
 int[] target = new int[nums.length];  
 int i = 0, k = 0;  
 while (i < index.length) {  
 for (k = target.length - 1; k > index[i]; k--)  
 target[k] = target[k - 1];  
 target[index[i]] = nums[i];  
 i++;  
 }  
 return target;  
 }   
}

**Another Solution: 02**

class Solution {  
 public int[] createTargetArray(int[] nums, int[] index) {  
 ArrayList<Integer> al = new ArrayList<>();  
 for(int i=0 ;i<nums.length;i++){  
 al.add(index[i],nums[i]);  
 }  
 int[] arr = new int[al.size()];  
 for(int i=0 ;i<nums.length;i++)  
 arr[i]=al.get(i);  
  
 return arr;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int[] createTargetArray(int[] nums, int[] index) {  
 int[] target = new int[nums.length];  
 for(int i = 0; i < index.length; i++){  
 int ind = index[i];  
 if(ind < i){  
 int j = i;  
 while(j > ind){  
 target[j] = target[j - 1];  
 target[j - 1] = nums[i];  
 j--;  
 }  
 }  
 else{  
 target[i] = nums[ind];  
 }  
 }  
 return target;  
 }  
}

**34. Problem: 2006. Count Number of Pairs with absolute Difference K.**

Given an integer array nums and an integer k, return *the number of pairs* (i, j) *where* i < j *such that* |nums[i] - nums[j]| == k.

The value of |x| is defined as:

x if x >= 0.

-x if x < 0.

Example 1:

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

Output: 4

Explanation: The pairs with an absolute difference of 1 are:

- [1,2,2,1]

- [1,2,2,1]

- [1,2,2,1]

- [1,2,2,1]

Example 2:

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

Output: 0

Explanation: There are no pairs with an absolute difference of 3.

Example 3:

Input: nums = [3,2,1,5,4], k = 2

Output: 3

Explanation: The pairs with an absolute difference of 2 are:

- [3,2,1,5,4]

- [3,2,1,5,4]

- [3,2,1,5,4]

Constraints:

1 <= nums.length <= 200

1 <= nums[i] <= 100

1 <= k <= 99

**Solution:**

**My Solution:**

class Solution\_2006 {  
 public int countKDifference(int[] nums, int k) {  
 int c = 0;  
 for (int i = 0; i < nums.length; i++) {  
 for (int j = i + 1; j < nums.length; j++) {  
 if ((nums[j] - nums[i]) == (-k) || (nums[j] - nums[i]) == (k)) {  
 c++;  
 }  
 }  
 }  
 return c;  
 }  
}  
  
// <https://leetcode.com/problems/count-number-of-pairs-with-absolute-difference-k/submissions/>

**Another Solution: 01**

class Solution {  
 public int countKDifference(int[] nums, int k) {  
 Map<Integer, Integer> map = new HashMap<>();  
 int res = 0;  
 for (int i = 0; i < nums.length; i++) {  
 if (map.containsKey(nums[i] - k)) {  
 res += map.get(nums[i] - k);  
 }  
 if (map.containsKey(nums[i] + k)) {  
 res += map.get(nums[i] + k);  
 }  
 map.put(nums[i], map.getOrDefault(nums[i], 0) + 1);  
 }  
 return res;  
 }  
}

**Another Solution: 02**

//Brute Force  
class Solution {  
 public int countKDifference(int[] nums, int k) {  
 int count = 0;  
 for (int i = 0; i < nums.length; i++)  
 for (int j = i + 1; j < nums.length; j++)  
 if (Math.*abs*(nums[j] - nums[i]) == k) count++;  
 return count;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int countKDifference(int[] a, int k) {  
 int count = 0;  
 int fre[] = new int[101];  
 for (int x : a) {  
 if (x - k >= 0) count += fre[x - k];  
 if (x + k <= 100) count += fre[x + k];  
 fre[x]++;  
 }  
 return count;  
 }  
}

**33. Problem: 2418. Sort the People**

You are given an array of strings names, and an array heights that consists of distinct positive integers. Both arrays are of length n.

For each index i, names[i] and heights[i] denote the name and height of the ith person.

Return names*sorted in descending order by the people's heights*.

Example 1:

Input: names = ["Mary","John","Emma"], heights = [180,165,170]

Output: ["Mary","Emma","John"]

Explanation: Mary is the tallest, followed by Emma and John.

Example 2:

Input: names = ["Alice","Bob","Bob"], heights = [155,185,150]

Output: ["Bob","Alice","Bob"]

Explanation: The first Bob is the tallest, followed by Alice and the second Bob.

Constraints:

n == names.length == heights.length

1 <= n <= 103

1 <= names[i].length <= 20

1 <= heights[i] <= 105

names[i] consists of lower and upper case English letters.

All the values of heights are distinct.

**Solution:**

**My Solution:**

class Solution\_2418 {  
 public String[] sortPeople(String[] names, int[] heights) {  
 int n = heights.length;  
 HashMap<Integer, String> hm = new HashMap<>();  
 for (int i = 0; i < n; i++) {  
 hm.put(heights[i], names[i]);  
 }  
 Arrays.*sort*(heights);  
 for (int j = 0; j < n; j++) {  
 names[n - j - 1] = hm.get(heights[j]);  
 }  
 return names;  
 }  
}  
  
// <https://leetcode.com/problems/sort-the-people/submissions/>

**Another Solution: 01**

class Solution {  
 public String[] sortPeople(String[] names, int[] heights) {  
 int n = heights.length;  
 String temp;  
 int t;  
 for (int i = 0; i < n; i++) {  
 for (int j = 1; j < (n - i); j++) {  
 if (heights[j - 1] < heights[j]) {  
 t = heights[j - 1];  
 heights[j - 1] = heights[j];  
 heights[j] = t;  
  
 temp = names[j - 1];  
 names[j - 1] = names[j];  
 names[j] = temp;  
 }  
 }  
 }  
 return names;  
 }  
}

**Another Solution: 02**

/\* we cannot sort input heights directly, because after sorted it we cannot know which height is belong to which person.  
So before sort, we need to add some extra information (in this case is "indices") to heights.  
Just image sorting "heights" and every "height" has a name tag on them, using the name tag we can know it's who's height.  
This is the 2D array comes from.  
 Then we can use build-in sort to sort the 2d array.  
 After sorted, we can get name via indices. \*/  
  
  
//Runtime: 9 ms, faster than 80.00% of Java online submissions for Sort the People.  
//Memory Usage: 42.9 MB, less than 100.00% of Java online submissions for Sort the People.  
//build-in sort  
//Time: O(NlgN + N); Space: O(N + lgN)  
//Time: O(NlgN); Space: O(N)  
  
class Solution {  
 public String[] sortPeople(String[] names, int[] heights) {  
 //Space: O(N)  
 //form a 2D array using people's height and their position in original array.  
 int[][] people = new int[names.length][2];  
 for (int i = 0; i < names.length; i++)  
 people[i] = new int[]{heights[i], i};  
  
 //Time: O(NlgN); Space: O(lgN)  
 //sort in descending order by the people's heights.  
 Arrays.*sort*(people, (a, b) -> b[0] - a[0]);  
  
 String[] res = new String[names.length];  
 //Time: O(N)  
 //Get result from sorted array.  
 for (int i = 0; i < names.length; i++)  
 res[i] = names[people[i][1]];  
  
 return res;  
 }  
}

**Another Solution: 03**

/\* Intuition  
People usually either uses quick sort or Hash map/ tree map to solve this problem. I found another way without using Map to achieve that using 2 dimensional array  
Approach  
 First, we need to make a two dimensional array containing index and height  
 Sort descendent by height  
 Fill the result array with names according to index  
 Code \*/  
  
class Solution {  
 public String[] sortPeople(String[] names, int[] heights) {  
 int arrLength = names.length;  
 int[][] heightOfPeople = new int[arrLength][2];  
  
 // Init array with current index and actual height  
 for (int i = 0; i < arrLength; i++) {  
 heightOfPeople[i][0] = i;  
 heightOfPeople[i][1] = heights[i];  
 }  
  
 // Sort descendent by height  
 Arrays.*sort*(heightOfPeople, (x, y) -> y[1] - x[1]);  
  
 // Fill the result array with names according to index  
 String[] results = new String[arrLength];  
 for (int i = 0; i < arrLength; i++) {  
 results[i] = names[heightOfPeople[i][0]];  
 }  
  
 return results;  
 }  
}

**32. Problem: 804. Unique Morse Code Words**

International Morse Code defines a standard encoding where each letter is mapped to a series of dots and dashes, as follows:

'a' maps to ".-",

'b' maps to "-...",

'c' maps to "-.-.", and so on.

For convenience, the full table for the 26 letters of the English alphabet is given below:

[".-","-...","-.-.","-..",".","..-.","--.","....","..",".---","-.-",".-..","--","-.","---",".--.","--.-",".-.","...","-","..-","...-",".--","-..-","-.--","--.."]

Given an array of strings words where each word can be written as a concatenation of the Morse code of each letter.

For example, "cab" can be written as "-.-..--...", which is the concatenation of "-.-.", ".-", and "-...". We will call such a concatenation the transformation of a word.

Return *the number of different transformations among all words we have*.

Example 1:

Input: words = ["gin","zen","gig","msg"]

Output: 2

Explanation: The transformation of each word is:

"gin" -> "--...-."

"zen" -> "--...-."

"gig" -> "--...--."

"msg" -> "--...--."

There are 2 different transformations: "--...-." and "--...--.".

Example 2:

Input: words = ["a"]

Output: 1

Constraints:

1 <= words.length <= 100

1 <= words[i].length <= 12

words[i] consists of lowercase English letters.

**Solution:**

**My Solution:**

class Solution\_804 {  
 public int uniqueMorseRepresentations(String[] words) {  
 String[] mappings = {".-", "-...", "-.-.", "-..", ".", "..-.", "--.", "....", "..", ".---", "-.-", ".-..", "--", "-.", "---", ".--.", "--.-", ".-.", "...", "-", "..-", "...-", ".--", "-..-", "-.--", "--.."};  
 Set<String> set = new HashSet();  
 StringBuilder code = new StringBuilder();  
 for (String s : words) {  
 for (int i = 0; i < s.length(); i++) {  
 code.append(mappings[s.charAt(i) - 'a']); // -'a' to get array index; Ascii val of a = 97  
 }  
 set.add(code.toString());  
 code.setLength(0); //clearing the stringbuilder  
 }  
 return set.size();  
 }  
}  
  
// <https://leetcode.com/problems/unique-morse-code-words/>

**Another Solution: 01**

//Java Stream  
class Solution {  
 public int uniqueMorseRepresentations(String[] words) {  
 String[] alphabet = new String[]{".-", "-...", "-.-.", "-..", ".", "..-.", "--.", "....", "..", ".---", "-.-", ".-.."  
 , "--", "-.", "---", ".--.", "--.-", ".-.", "...", "-", "..-", "...-", ".--", "-..-", "-.--", "--.."};  
 return (int) Arrays.*stream*(words).map(word -> word.chars().mapToObj(character -> alphabet[character - 'a'])  
 .collect(Collectors.*joining*())).distinct().count();  
 }  
}

**Another Solution: 02**

class Solution {  
 public int uniqueMorseRepresentations(String[] words) {  
 HashMap<Character, String> map = new HashMap<>();  
 map.put('a', ".-"); map.put('b', "-..."); map.put('c', "-.-."); map.put('d', "-..");  
 map.put('e', "."); map.put('f', "..-."); map.put('g', "--."); map.put('h', "....");  
 map.put('i', ".."); map.put('j', ".---"); map.put('k', "-.-"); map.put('l', ".-..");  
 map.put('m', "--"); map.put('n', "-."); map.put('o', "---"); map.put('p', ".--.");  
 map.put('q', "--.-"); map.put('r', ".-."); map.put('s', "..."); map.put('t', "-");  
 map.put('u', "..-"); map.put('v', "...-"); map.put('w', ".--"); map.put('x', "-..-");  
 map.put('y', "-.--"); map.put('z', "--..");  
  
 HashSet<String> set = new HashSet<>();  
 for (int i = 0; i < words.length; i++) {  
 String str = words[i];  
 String str1 = "";  
 for (int j = 0; j < str.length(); j++) {  
 str1 = str1 + map.get(str.charAt(j));  
 }  
 set.add(str1);  
 }  
 return set.size();  
  
 }  
}

**Another Solution: 03**

class Solution {  
 public int uniqueMorseRepresentations(String[] words) {  
 String[] arr = new String[]{".-", "-...", "-.-.", "-..", ".", "..-.", "--.", "....", "..", ".---", "-.-", ".-..", "--", "-.", "---", ".--.", "--.-", ".-.", "...", "-", "..-", "...-", ".--", "-..-", "-.--", "--.."};  
  
 HashSet<String> set = new HashSet<>();  
 for (String word : words)  
 set.add(transformMorse(word, arr));  
 return set.size();  
 }  
  
 private String transformMorse(String word, String[] arr) {  
 StringBuilder build = new StringBuilder();  
 for (char c : word.toCharArray())  
 build.append(arr[(int) c - 97]);  
 return build.toString();  
 }  
}

**31. Problem: 1588. Sum of All Odd Length Subarrays**

Given an array of positive integers arr, return *the sum of all possible odd-length subarrays of*arr.

A subarray is a contiguous subsequence of the array.

Example 1:

Input: arr = [1,4,2,5,3]

Output: 58

Explanation: The odd-length subarrays of arr and their sums are:

[1] = 1

[4] = 4

[2] = 2

[5] = 5

[3] = 3

[1,4,2] = 7

[4,2,5] = 11

[2,5,3] = 10

[1,4,2,5,3] = 15

If we add all these together we get 1 + 4 + 2 + 5 + 3 + 7 + 11 + 10 + 15 = 58

Example 2:

Input: arr = [1,2]

Output: 3

Explanation: There are only 2 subarrays of odd length, [1] and [2]. Their sum is 3.

Example 3:

Input: arr = [10,11,12]

Output: 66

Constraints:

1 <= arr.length <= 100

1 <= arr[i] <= 1000

**Solution:**

**My Solution:**

class Solution\_1588 {  
 public int sumOddLengthSubarrays(int[] arr) {  
 int sum = 0;  
 for (int i = 0; i < arr.length; i++)  
 sum += (arr[i] \* ((((i + 1) \* (arr.length - i)) + 1) / 2));  
 return sum;  
 }  
}  
  
// <https://leetcode.com/problems/sum-of-all-odd-length-subarrays/>

**Another Solution: 01**

/\* Input array = [1,4,2,5,3]  
  
 Subarrays and Subsequence are two different things. Eg- [1,4,2],[4,2,5] but not [1,4,5].  
 Subarrays contains continuous array elements, whereas Subsequence contains 2^N elements(They can skip inbetween elements to form an array). Eg-[1,4,5]  
 Let us define all the subarrays:  
 length 1  
 1  
 4  
 2  
 5  
 3  
 length 2  
 1,4  
 4,2  
 2,5  
 5,3  
 length 3  
 1,4,2  
 4,2,5  
 2,5,3  
 length 4  
 1,4,2,5  
 4,2,5,3  
 length 5  
 1,4,2,5,3  
 Here we need to only consider odd lengths - (length 1, length 3, length 5)  
 We can see a pattern:  
 0 1 2 3 4 (index)  
 1 4 2 5 3 (array elements)  
 3 4 5 4 3 (number of times array elements occurs in length 1, length 3, length 5). Eg- 4 occurs one time in length 1 + two times in length 3 + one time in length 5.  
 3 16 10 20 9 (Total= array elements \* num of times it occurs) = 3+16+10+20+9 = 58.  
  
 Challenge is to calculate number of times an array element occurs:  
 Let us consider array element 1:  
 Consider index 0  
 Find how many subarrays start with that index = 1([1])+1([1,4])+1([1,4,2])+1([1,4,2,5])+1([1,4,2,5,3]) = 5.  
 Find how many subarrays end with that index = 1[1] = 1.  
  
 Consider index 1  
 Find how many subarrays start with that index = 1([1,4])+1([1,4,2])+1([1,4,2,5])+1([1,4,2,5,3]) = 4.  
 Find how many subarrays end with that index = 1[1] = 1.  
  
 Pattern: start = n-i  
 End = i+1  
 Total number of times : start \* end (Remember this is for both odd and even)  
 Odd = Total / 2 (Consider adding extra one to the odd) (3 4 5 4 3)  
 Result = array element \* odd  
 Do it for all the array elements and corresponding odd numbers and add it to result. (3+16+10+20+9=58) \*/  
  
class Solution {  
 public int sumOddLengthSubarrays(int[] arr) {  
 int result = 0;  
 int n = arr.length;  
 for (int i = 0; i < n; i++) {  
 int end = i + 1;  
 int start = n - i;  
 int total = start \* end;  
 int odd = total / 2;  
 if (total % 2 == 1) {  
 odd++;  
 }  
 result += odd \* arr[i];  
 }  
 return result;  
 }  
}

**Another Solution: 02**

//Method 1: T: O(n³) | S: O(1) | Sliding Window (Brute force)

class Solution {   
 public int sumOddLengthSubarrays3(int[] arr) {  
 int total = 0;  
 for (int window = 1; window <= arr.length; window += 2)  
 for (int i = 0; i + window <= arr.length; i++)  
 for (int j = i; j < i + window; j++)  
 total += arr[j];  
 return total;  
 }  
}  
  
  
// Method 2: T: O(n²) | S: O(1) | Sliding Window (optimised)  
class Solution {  
 public int sumOddLengthSubarrays(int[] arr) {  
 int total = 0;  
 for (int windowSize = 1; windowSize <= arr.length; windowSize += 2) {  
 // sum up all the elements in the first window, W1  
 int windowSum = 0;  
 for (int i = 0; i < windowSize; i++)  
 windowSum += arr[i];  
 total += windowSum;  
 // slide W1 one element at a time.  
 // remove (subtract) the first element from the W1 and insert (add) the last element of the slided W1 into the previous sum.  
 for (int i = 1; i + windowSize <= arr.length; i++) {  
 windowSum = windowSum - arr[i - 1] + arr[i + windowSize - 1];  
 total += windowSum;  
 }  
 }  
 return total;  
 }  
}

**Another Solution: 03**

/\* Method 3: T: O(n) | S: O(1) | Counting element occurence  
  
courtesy: https://leetcode.com/problems/sum-of-all-odd-length-subarrays/discuss/980310/Dew-It-or-O(n)-1-pass-or-(Almost)-No-math  
A brilliant solution-explanation combo, please upvote it.  
I've slightly refactored the above solution. Please read the original solution to understand better.  
IMO, this solution is one of those that if you already know it, then you know it, else its not easy to conjure this in a live interview, unless you have acute observation skills. No interviewer should expect this solution. Expectation would be that you come up with Method 1 then optimise it to Method 2. \*/  
  
class Solution {  
 public int sumOddLengthSubarrays(int[] arr) {  
 int n = arr.length, sum = 0;  
 int evenStops = (n & 1) == 0 ? n / 2 : n / 2 + 1;  
 int evenStarts = 1;  
 int oddStarts = 0;  
 int oddStops = n / 2;  
 for (int i = 0; i < n; ++i) {  
 sum += ((oddStops \* oddStarts) + (evenStops \* evenStarts)) \* arr[i];  
 if ((i & 1) == 0) {  
 oddStarts++;  
 evenStops--;  
 } else {  
 evenStarts++;  
 oddStops--;  
 }  
 }  
 return sum;  
 }  
}

**Day 06-2194, 2325, 1720, 66, 136.**

**30. Problem: 2194. Cells in a Range on a Excel Sheet**

A cell (r, c) of an excel sheet is represented as a string "<col><row>" where:

<col> denotes the column number c of the cell. It is represented by alphabetical letters.

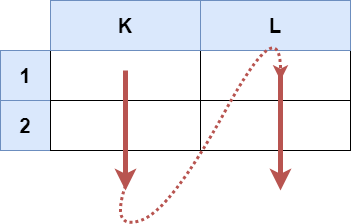
For example, the 1st column is denoted by 'A', the 2nd by 'B', the 3rd by 'C', and so on.

<row> is the row number r of the cell. The rth row is represented by the integer r.

You are given a string s in the format "<col1><row1>:<col2><row2>", where <col1> represents the column c1, <row1> represents the row r1, <col2> represents the column c2, and <row2> represents the row r2, such that r1 <= r2 and c1 <= c2.

Return *the list of cells* (x, y) *such that* r1 <= x <= r2 *and* c1 <= y <= c2. The cells should be represented as strings in the format mentioned above and be sorted in non-decreasing order first by columns and then by rows.

Example 1:



Input: s = "K1:L2"

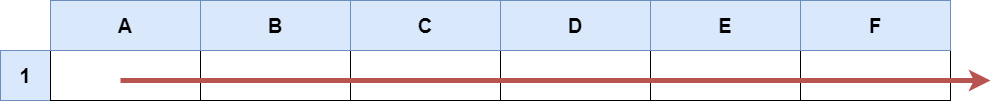
Output: ["K1","K2","L1","L2"]

Explanation:

The above diagram shows the cells which should be present in the list.

The red arrows denote the order in which the cells should be presented.

Example 2:



Input: s = "A1:F1"

Output: ["A1","B1","C1","D1","E1","F1"]

Explanation:

The above diagram shows the cells which should be present in the list.

The red arrow denotes the order in which the cells should be presented.

Constraints:

s.length == 5

'A' <= s[0] <= s[3] <= 'Z'

'1' <= s[1] <= s[4] <= '9'

s consists of uppercase English letters, digits and ':'.

**Solution:**

**My Solution:**

class Solution\_2194 {  
 public List<String> cellsInRange(String s) {  
 char c1 = s.charAt(0), c2 = s.charAt(3);  
 char r1 = s.charAt(1), r2 = s.charAt(4);  
 List<String> cells = new ArrayList<>();  
 for (char c = c1; c <= c2; ++c) {  
 for (char r = r1; r <= r2; ++r) {  
 cells.add("" + c + r);  
 }  
 }  
 return cells;  
 }  
}  
  
// <https://leetcode.com/problems/cells-in-a-range-on-an-excel-sheet/>

**Another Solution: 01**

class Solution {  
 public List < String > cellsInRange(String s) {  
 String[] str = s.split(":");  
 List < String > res = new ArrayList < > ();  
 int a = Character.*getNumericValue*(str[0].charAt(1));  
 int b = Character.*getNumericValue*(str[1].charAt(1));  
 int c1 = str[0].charAt(0) - 'A';  
 int c2 = str[1].charAt(0) - 'A';  
  
 for (int i = c1; i <= c2; i++) {  
 StringBuilder sb = new StringBuilder();  
 sb.append(Character.*toString*(i + 65));  
 for (int j = a; j <= b; j++) {  
 sb.append(j);  
  
 res.add(sb.toString());  
  
 sb = sb.deleteCharAt(sb.length() - 1);  
 }  
 }  
 return res;  
 }  
}

**Another Solution: 02**

class Solution {  
 public List cellsInRange(String s) {  
 String a=s.substring(1,2);  
 String b=s.substring(s.length()-1,s.length());  
  
 List<String> list=new ArrayList<>();  
 char c=s.charAt(0);  
 char d=s.charAt(3);  
  
 if(a.equals(b)){  
 for(char m=c;m<=d;m++){  
 // System.out.println(m);  
 list.add(m+a);  
 }  
 }  
 else{  
 int x=Integer.*parseInt*(a);  
 int y=Integer.*parseInt*(b);  
 for(int z=x;z<=y;z++){  
 for(char m=c;m<=d;m++){  
 String last=Integer.*toString*(z);  
 list.add(m+last);  
 }  
 }  
 }  
 Collections.*sort*(list);  
 return list;  
 }  
}

**Another Solution: 03**

class Solution {  
 public List<String> cellsInRange(String s) {  
 String alpha = "ABCDEFGHIJKLMNOPQRSTUVWXYZ";  
 String number = "0123456789";  
 ArrayList<String> list = new ArrayList<>();  
 String str = new String();  
 int colIndexStart = alpha.indexOf(Character.*toString*(s.charAt(0)));  
 int colIndexEnd = alpha.indexOf(Character.*toString*(s.charAt(3)));  
 int rowIndexStart = Integer.*valueOf*(s.charAt(1)-48);  
 int rowIndexEnd = Integer.*valueOf*(s.charAt(4)-48);  
 for(int i=colIndexStart; i<=colIndexEnd; i++){  
 for(int j=rowIndexStart; j<=rowIndexEnd; j++){  
 str += alpha.charAt(i);  
 str += number.charAt(j);  
 list.add(str);  
 str = "";  
 }  
 }  
 return list;  
 }

**29. Problem: 2325. Decode the Message**

You are given the strings key and message, which represent a cipher key and a secret message, respectively. The steps to decode message are as follows:

Use the first appearance of all 26 lowercase English letters in key as the order of the substitution table.

Align the substitution table with the regular English alphabet.

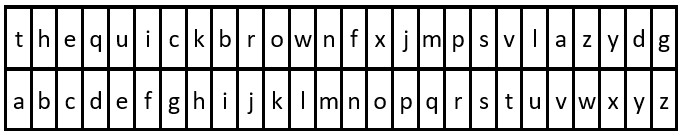
Each letter in message is then substituted using the table.

Spaces ' ' are transformed to themselves.

For example, given key = "happy boy" (actual key would have at least one instance of each letter in the alphabet), we have the partial substitution table of ('h' -> 'a', 'a' -> 'b', 'p' -> 'c', 'y' -> 'd', 'b' -> 'e', 'o' -> 'f').

Return *the decoded message*.

Example 1:



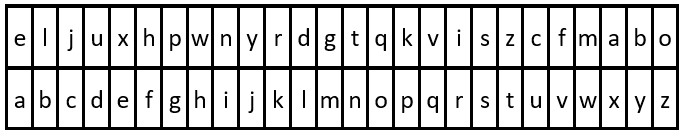
Input: key = "the quick brown fox jumps over the lazy dog", message = "vkbs bs t suepuv"

Output: "this is a secret"

Explanation: The diagram above shows the substitution table.

It is obtained by taking the first appearance of each letter in "the quick brown fox jumps over the lazy dog".

Example 2:



Input: key = "eljuxhpwnyrdgtqkviszcfmabo", message = "zwx hnfx lqantp mnoeius ycgk vcnjrdb"

Output: "the five boxing wizards jump quickly"

Explanation: The diagram above shows the substitution table.

It is obtained by taking the first appearance of each letter in "eljuxhpwnyrdgtqkviszcfmabo".

Constraints:

26 <= key.length <= 2000

key consists of lowercase English letters and ' '.

key contains every letter in the English alphabet ('a' to 'z') at least once.

1 <= message.length <= 2000

message consists of lowercase English letters and ' '.

**Solution:**

**My Solution:**

class Solution\_2325 {  
 public String decodeMessage(String key, String message) {  
 StringBuilder ans = new StringBuilder();//Using String Builder to append the string  
 key = key.replaceAll(" ", "");  
 //Removing the spaces  
 HashMap<Character, Character> letters = new HashMap<>();  
 //Mapping the key into a hashmap.  
 char original = 'a';  
 for (int i = 0; i < key.length(); i++) {  
 if (!letters.containsKey(key.charAt(i))) {  
 letters.put(key.charAt(i), original++);  
 }  
 }  
 //After the first pass all the letters of the key will be mapped with their respective original letters.  
 for (int i = 0; i < message.length(); i++) {  
 if (letters.containsKey(message.charAt(i))) {  
 //Now replacing the letters of the message with appropriate letter according to the key  
 ans.append(letters.get(message.charAt(i)));  
 } else {  
 ans.append(message.charAt(i));  
 //This is for characters other than the letters in the key example a space " "  
 //They will not be replaced by any letters hence original letter is appended into the StringBuilder  
 }  
 }  
 return ans.toString();  
 }  
}  
  
// <https://leetcode.com/problems/decode-the-message/>

**Another Solution: 01**

class Solution {  
 public String decodeMessage(String key, String message) {  
 char[] map = new char[26];  
 int i = 0; // iterator.  
 for (char current\_ch : key.toCharArray()) {  
 if (i < 26 && current\_ch != ' ' && map[current\_ch - 'a'] == 0) {  
 map[current\_ch - 'a'] = (char) (i + 'a'); // i+'a' 'b' and convering to character. 97+1 = 98(b);  
 i++; // increament iterator. keep iterating.  
 }  
 }  
 String decode = "";  
 for (char current\_ch : message.toCharArray()) {  
 decode += current\_ch == ' ' ? ' ' : map[current\_ch - 'a'];  
 }  
 return decode;  
 }  
}

**Another Solution: 02**

class Solution {  
 public String decodeMessage(String key, String message) {  
 char[] m = new char[128];  
 m[' '] = ' ';  
 char cur = 'a';  
 for (var k : key.toCharArray())  
 m[k] = m[k] != 0 ? m[k] : cur++;  
 return message.chars().mapToObj(i -> String.*valueOf*(m[i])).collect(Collectors.*joining*());  
 }  
}

**Another Solution: 03**

class Solution {  
 public String decodeMessage(String key, String message) {  
 Map<Character, Character> map = new HashMap<>();  
 int a = 97;  
 for (char c : key.toCharArray()) {  
 if (c == ' ') {  
 continue;  
 } else {  
 if (!map.containsKey(c)) {  
 map.put(c, (char) a);  
 a++;  
 }  
 }  
 }  
 StringBuilder sb = new StringBuilder();  
 for (char c1 : message.toCharArray()) {  
 if (c1 != ' ') {  
 sb.append(map.get(c1));  
 } else {  
 sb.append(" ");  
 }  
 }  
 return sb.toString();  
 }  
}

**28. Problem: 1720. Decode XORed Array**

There is a hidden integer array arr that consists of n non-negative integers.

It was encoded into another integer array encoded of length n - 1, such that encoded[i] = arr[i] XOR arr[i + 1]. For example, if arr = [1,0,2,1], then encoded = [1,2,3].

You are given the encoded array. You are also given an integer first, that is the first element of arr, i.e. arr[0].

Return *the original array* arr. It can be proved that the answer exists and is unique.

Example 1:

Input: encoded = [1,2,3], first = 1

Output: [1,0,2,1]

Explanation: If arr = [1,0,2,1], then first = 1 and encoded = [1 XOR 0, 0 XOR 2, 2 XOR 1] = [1,2,3]

Example 2:

Input: encoded = [6,2,7,3], first = 4

Output: [4,2,0,7,4]

Constraints:

2 <= n <= 104

encoded.length == n - 1

0 <= encoded[i] <= 105

0 <= first <= 105

**Solution:**

**My Solution:**

class Solution\_1720 {  
 public int[] decode(int[] encoded, int first) {  
 int first1 = first;  
 int[] result = new int[encoded.length + 1];  
 result[0] = first;  
 for (int i = 0; i < encoded.length; i++) {  
 result[i + 1] = first1 ^ encoded[i];  
 first1 = first1 ^ encoded[i];  
 }  
 return result;  
 }  
}  
  
// <https://leetcode.com/problems/decode-xored-array/>

**Another Solution: 01**

class Solution {  
 public int[] decode(int[] encoded, int first) {  
 int arr[] = new int[encoded.length + 1];  
 arr[0] = first;  
 for (int i = 0; i < arr.length - 1; i++) {  
 arr[i + 1] = arr[i] ^ encoded[i];  
 }  
 return arr;  
 }  
}  
/\* Explaination:  
 \* A(XOR)B = C  
 \* C(XOR)B = A  
 \*/

**Another Solution: 02**

class Solution {  
 public int[] decode(int[] encoded, int first) {  
 int x;  
 int arr[] = new int[encoded.length + 1];  
 arr[0] = first;  
 for (int i = 0; i < encoded.length; i++) {  
 x = encoded[i] ^ first;  
 arr[i + 1] = x;  
 first = x;  
 }  
 return arr;  
 }  
}

**Another Solution: 03**

//first = 1 encoded[0] = 1  
// bitwise XOR ("1 + 0 = 1 , 0 + 1 = 1, 0 + 0 = 0, 1 + 1 = 1")  
// 0001 ^ 0001 = 0000 = 0  
// Performing an operation with xor and traditional operator  
  
// Time: O(n)  
// Space: O(n)  
// explanation:  
// given = [6,2,7,3]  
// first = 4  
  
// decodedArr = [4], initialized with the value of first  
// 4 xor 6 = 2, add 2 into decodedArr  
// decodedArr = [4, 2]  
// 2 xor 2 = 0, add 0 into decodedArr  
// decodedArr = [4, 2, 0]  
// 0 xor 7 = 7, add 7 into decodedArr  
// decodedArr = [4, 2, 0, 7]  
// 7 xor 3 = 4 , add 4 into decodedArr  
// final decodedArr = [4, 2, 0, 7, 4]  
  
  
class Solution {  
 public int[] decode(int[] encoded, int first) {  
 // initalize the array with the amount of space necessary  
 int[] decodedArr = new int [encoded.length+1];  
  
 // the first value would always be the value of first  
 decodedArr[0] = first;  
  
 // keep track of the xor value  
 int xor = first;  
  
 for (int i=0; i<encoded.length; i++) {  
 // '^' expression is xor  
 // xor value gets updated  
 xor = xor ^ encoded[i];  
  
 // System.out.println(xor);  
  
 // add the new decoded value to the new array  
 decodedArr[i+1] = xor;  
 }  
  
 return decodedArr;  
 }  
}

**27. Problem: 66. Plus One**

You are given a large integer represented as an integer array digits, where each digits[i] is the ith digit of the integer. The digits are ordered from most significant to least significant in left-to-right order. The large integer does not contain any leading 0's.

Increment the large integer by one and return *the resulting array of digits*.

Example 1:

Input: digits = [1,2,3]

Output: [1,2,4]

Explanation: The array represents the integer 123.

Incrementing by one gives 123 + 1 = 124.

Thus, the result should be [1,2,4].

Example 2:

Input: digits = [4,3,2,1]

Output: [4,3,2,2]

Explanation: The array represents the integer 4321.

Incrementing by one gives 4321 + 1 = 4322.

Thus, the result should be [4,3,2,2].

Example 3:

Input: digits = [9]

Output: [1,0]

Explanation: The array represents the integer 9.

Incrementing by one gives 9 + 1 = 10.

Thus, the result should be [1,0].

Constraints:

1 <= digits.length <= 100

0 <= digits[i] <= 9

digits does not contain any leading 0's.

**Solution:**

**My Solution:**

class Solution\_66 {  
 public int[] plusOne(int[] digits) {  
  
 String s = "";  
 for (int i = 0; i < digits.length; i++) {  
 s += digits[i];  
 }  
  
 Integer total = 1 + Integer.*parseInt*(s);  
  
 String ss = String.*valueOf*(total);  
  
 char[] c = ss.toCharArray();  
 int[] result = new int[c.length];  
 int i = 0;  
 for (char d : c) {  
 result[i] = Integer.*parseInt*(Character.*toString*(d));  
 i++;  
 }  
 return result;  
 }  
}  
  
// <https://leetcode.com/problems/plus-one/>

**Another Solution: 01**

class Solution {  
 public int[] plusOne(int[] digits) {  
 for(int i=digits.length-1;i>=0;i--)  
 {  
 if(digits[i]!=9)  
 {  
 digits[i]++;  
 break;  
 }else  
 digits[i]=0;  
 }  
 if(digits[0]==0)  
 {  
 int[]res=new int [digits.length+1];  
 res[0]=1;  
 return res;  
 }  
 return digits;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int[] plusOne(int[] digits) {  
 for (int i = digits.length - 1; i >= 0; i--) {  
 if (digits[i] < 9) {  
 digits[i]++;  
 return digits;  
// starting from extreme right--> if array[i] is less than 9 means can be added with 1  
// i.e. [ 5,8 ]-->[ 5,9 ] or  
// [ 9,4 ]-->[ 9,5 ] or  
// [ 6,0 ]-->[ 6,1 ]  
// and will directly return array  
 }  
 digits[i] = 0;  
// if array[i] is not less than 9, means it have to be 9 only then digit is changed to 0,  
// and we again revolve around loop to check for number if less than 9 or not  
// i.e. [ 5,9 ]-->[ 5,0 ]-loop->[ 6,0 ] or  
// [ 1,9,9 ]-->[ 1,9,0 ]-loop->[ 1,0,0 ]-loop->[ 2,0,0 ]  
// and will directly return array  
 }  
// if all number inside array are 9  
// i.e. [ 9,9,9,9 ] than according to above loop it will become [ 0,0,0,0 ]  
// but we have to make it like this [ 9,9,9,9 ]-->[ 1,0,0,0,0 ]  
  
  
// to make like above we need to make new array of length--> n+1  
// by default new array values are set to -->0 only  
// thus just changed first value of array to 1 and return the array  
  
 digits = new int[digits.length + 1];  
 digits[0] = 1;  
 return digits;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int[] plusOne(int[] digits) {  
 for (int i = digits.length - 1; i >= 0; i--) {  
 if (digits[i] != 9) {  
 digits[i]++;  
 break;  
 } else {  
 digits[i] = 0;  
 }  
 }  
 if (digits[0] == 0) {  
 int[] res = new int[digits.length + 1];  
 res[0] = 1;  
 return res;  
 }  
 return digits;  
 }   
}

**26. Problem: 136. Single Number**

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

You must implement a solution with a linear runtime complexity and use only constant extra space.

Example 1:

Input: nums = [2,2,1]

Output: 1

Example 2:

Input: nums = [4,1,2,1,2]

Output: 4

Example 3:

Input: nums = [1]

Output: 1

Constraints:

1 <= nums.length <= 3 \* 104

-3 \* 104 <= nums[i] <= 3 \* 104

Each element in the array appears twice except for one element which appears only once.

**Solution:**

**My Solution:**

class Solution\_136 {  
 public int singleNumber(int[] nums) {  
 int result = 0;  
 for (int i : nums) {  
 result ^= i;  
 }  
 return result;  
 }  
}  
  
// <https://leetcode.com/problems/single-number/>

**Another Solution: 01**

public class Solution {  
 public int singleNumber(int[] nums) {  
 int result = 0;  
 for (int i : nums) {  
 result ^= i;  
 }  
 return result;  
 }  
}

**Another Solution: 02**

//First Approach by using hashMap :-  
class Solution {  
 public int singleNumber(int[] nums) {  
 HashMap<Integer, Integer> hash = new <Integer, Integer>HashMap();  
  
 for (int x : nums) {  
 if (hash.containsKey(x)) { //if hashmap contains 'element', then increase correspoding val  
 int count = hash.get(x);  
 hash.put(x, ++count);  
 } else  
 hash.put(x, 1); //if hashmap does not contain 'element', then put it in hashmap  
 }  
  
 for (int x : hash.keySet()) { //Iterate through 'keys' of HashMap  
 if (hash.get(x) == 1) //if 'value' for 'key' is '1', then return that 'key' element  
 return x;  
 }  
 return -1;  
 }  
}

**Another Solution: 03**

*/\*\*  
 \* Time Complexity : O(nlogn) , as there is a for loop and inside for loop 'hash.containsKey'  
 \* Space Complexity : O(n) , as HashMap of size nearly 'n/2' is used.  
 \* Second Approach by using 'Sort()' method :-  
 \*/*class Solution {  
 public int singleNumber(int[] nums) {  
 Arrays.*sort*(nums); //Sort the array  
 for (int i = 0; i < nums.length - 1; i += 2) {  
 if (nums[i] != nums[i + 1]) //Check pairwise values in array  
 return nums[i]; //if any pairwise values are different, then it is answer  
 }  
 return nums[nums.length - 1]; //if answer is largest value, then it will not be detected in above loop hence return it here  
 }  
}

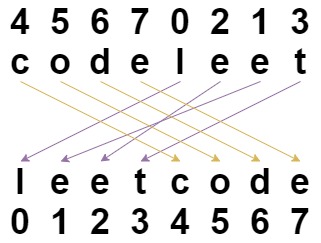
**Day 05-771, 1678, 2057, 2367, 1528.**

**25. Problem: 1528. Shuffle String**

You are given a string s and an integer array indices of the same length. The string s will be shuffled such that the character at the ith position moves to indices[i] in the shuffled string.

Return *the shuffled string*.

Example 1:



Input: s = "codeleet", indices = [4,5,6,7,0,2,1,3]

Output: "leetcode"

Explanation: As shown, "codeleet" becomes "leetcode" after shuffling.

Example 2:

Input: s = "abc", indices = [0,1,2]

Output: "abc"

Explanation: After shuffling, each character remains in its position.

Constraints:

s.length == indices.length == n

1 <= n <= 100

s consists of only lowercase English letters.

0 <= indices[i] < n

All values of indices are unique.

**Solution:**

**My Solution:**

class Solution\_1528 {  
 public String restoreString(String s, int[] in) {  
 char[] c = new char[in.length];  
 for (int i = 0; i < in.length; i++)  
 c[in[i]] = s.charAt(i);  
 return new String(c);  
 }  
}  
// O(n) - Time and Space  
  
// <https://leetcode.com/problems/shuffle-string/>

**Another Solution: 01**

*/\*\*  
 \* Cyclic Sort -O(n) Time , O(1) Space  
 \* The approach is to position the index found from the indices array at the correct location  
 \* loop through the elements of the indices array  
 \* continuously swap the characters at index and i and the index of the indices array  
 \*/*class Solution {  
 public String restoreString(String s, int[] indices) {  
 char[] chArray = s.toCharArray();  
 int i = 0;  
 while (i < indices.length) {  
 if (indices[i] != i) {  
 int index = indices[i];  
 // swap characters  
 char temp1 = chArray[index];  
 chArray[index] = chArray[i];  
 chArray[i] = temp1;  
 // swap indexes  
 int temp2 = indices[index];  
 indices[index] = indices[i];  
 indices[i] = temp2;  
 } else {  
 i++;  
 }  
 }  
 return new String(chArray);  
 }  
}

**Another Solution: 02**

class Solution {  
 public String restoreString(String s, int[] indices) {  
 StringBuilder res = new StringBuilder(s);  
 int l = s.length();  
 for (int i = 0; i < l; i++) {  
 res.setCharAt(indices[i], s.charAt(i));  
 }  
 return res.toString();  
 }  
}

**Another Solution: 03**

class Solution {  
 public String restoreString(String s, int[] indices) {  
 String answer = "";  
 int a = 0;  
 for (int i = 0; i < indices.length; i++) {  
 if (a < indices.length) {  
 if (indices[i] == a) {  
 answer += s.charAt(i);  
 a++;  
 i = -1;  
 }  
 }  
 }  
 return answer;  
 }  
}

**24. Problem: 2367. Number of Arithmetic triplets**

You are given a 0-indexed, strictly increasing integer array nums and a positive integer diff. A triplet (i, j, k) is an arithmetic triplet if the following conditions are met:

i < j < k,

nums[j] - nums[i] == diff, and

nums[k] - nums[j] == diff.

Return *the number of unique arithmetic triplets.*

Example 1:

Input: nums = [0,1,4,6,7,10], diff = 3

Output: 2

Explanation:

(1, 2, 4) is an arithmetic triplet because both 7 - 4 == 3 and 4 - 1 == 3.

(2, 4, 5) is an arithmetic triplet because both 10 - 7 == 3 and 7 - 4 == 3.

Example 2:

Input: nums = [4,5,6,7,8,9], diff = 2

Output: 2

Explanation:

(0, 2, 4) is an arithmetic triplet because both 8 - 6 == 2 and 6 - 4 == 2.

(1, 3, 5) is an arithmetic triplet because both 9 - 7 == 2 and 7 - 5 == 2.

Constraints:

3 <= nums.length <= 200

0 <= nums[i] <= 200

1 <= diff <= 50

nums is strictly increasing.

**Solution:**

**My Solution:**

class Solution\_2367 {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 int t = 0;  
  
 for (int i = 0; i < nums.length; i++) {  
 for (int j = 0; j < nums.length; j++) {  
 for (int k = 0; k < nums.length; k++) {  
 if (i != j && j != k && i < j && j < k && nums[j] - nums[i] == diff && nums[k] - nums[j] == diff) {  
 t += 1;  
 }  
 }  
 }  
 }  
 return t;  
 }  
}  
  
// <https://leetcode.com/problems/number-of-arithmetic-triplets/>

**Another Solution: 01**

class Solution {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 int cnt = 0;  
 Set<Integer> seen = new HashSet<>();  
 for (int num : nums) {  
 if (seen.contains(num - diff) && seen.contains(num - diff \* 2)) {  
 ++cnt;  
 }  
 seen.add(num);  
 }  
 return cnt;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 int count = 0;  
 Map<Integer,Integer> map = new HashMap<>();  
 for(int i=0;i<nums.length;i++) map.put(nums[i],i);  
 for(int k : nums) count += (map.containsKey(k+diff) && map.containsKey(k+2\*diff)) ? 1 : 0;  
 return count;  
 }  
 // Time Complexity : O(log(n))  
 // Space Complexity : O(n)  
}

**Another Solution: 03**

class Solution {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 int count = 0;  
 int pointer1 = 0 , pointer2 = 1 , pointer3 = 2;  
 while(pointer3 < nums.length){  
 int compare = nums[pointer2]-nums[pointer1];  
 if(compare==diff){  
 compare = nums[pointer3]-nums[pointer2];  
 if(compare==diff){  
 pointer1++;  
 pointer2++;  
 pointer3++;  
 count++;  
 }  
 else if(compare<diff) pointer3++;  
 else{  
 pointer1++;pointer2++;  
 pointer3 = Math.*max*(pointer3,pointer2+1);  
 }  
 }  
 else if(compare<diff){  
 pointer2++;  
 pointer3 = Math.*max*(pointer3,pointer2+1);  
 }  
 else{  
 pointer1++;  
 pointer2 = Math.*max*(pointer2,pointer1+1);  
 pointer3 = Math.*max*(pointer3,pointer2+1);  
 }  
 }  
 return count;  
 }  
 // Time Complexity : O(n)  
 // Space Complexity : O(1)  
}

**23. Problem: 2057. Smallest Index with Equal Value**

Given a 0-indexed integer array nums, return *the smallest index*i*of*nums*such that*i mod 10 == nums[i]*, or*-1*if such index does not exist*.

x mod y denotes the remainder when x is divided by y.

Example 1:

Input: nums = [0,1,2]

Output: 0

Explanation:

i=0: 0 mod 10 = 0 == nums[0].

i=1: 1 mod 10 = 1 == nums[1].

i=2: 2 mod 10 = 2 == nums[2].

All indices have i mod 10 == nums[i], so we return the smallest index 0.

Example 2:

Input: nums = [4,3,2,1]

Output: 2

Explanation:

i=0: 0 mod 10 = 0 != nums[0].

i=1: 1 mod 10 = 1 != nums[1].

i=2: 2 mod 10 = 2 == nums[2].

i=3: 3 mod 10 = 3 != nums[3].

2 is the only index which has i mod 10 == nums[i].

Example 3:

Input: nums = [1,2,3,4,5,6,7,8,9,0]

Output: -1

Explanation: No index satisfies i mod 10 == nums[i].

Constraints:

1 <= nums.length <= 100

0 <= nums[i] <= 9

**Solution:**

**My Solution:**

class Solution\_2057 {  
 public int smallestEqual(int[] nums) {  
 for (int i = 0; i < nums.length; i++) {  
 if (i % 10 == nums[i]) {  
 return i;  
 }  
 }  
 return -1;  
 }  
}  
  
// <https://leetcode.com/problems/smallest-index-with-equal-value/>

**Another Solution: 01**

class Solution {  
 public int smallestEqual(int[] nums) {  
 int min = 101;  
 for (int i = 0; i < nums.length; i++) {  
 if (i % 10 == nums[i]) {  
 min = Math.*min*(min, i);  
 }  
 }  
 return min == 101 ? -1 : min;  
 }  
}  
// TC: O(n), SC: O(1)

**Another Solution: 02**

class Solution {  
 public int smallestEqual(int[] nums) {  
 int index = 0;  
 for (int i = 0; i < nums.length; i++) {  
 if (index == nums[i]) {  
 return i;  
 }  
 if (++index == 10) {  
 index = 0;  
 }  
 }  
 return -1;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int smallestEqual(int[] nums) {  
 int n = nums.length; // Length of the array  
 int min = Integer.*MAX\_VALUE*; // Assign max value to min variable  
 int ans = 0;// Declare and initialize the ans variable  
 for (int i = 0; i < n; i++) { // Loop for iterating the mod operator throughout the elements  
 if (i % 10 == nums[i]) {  
 ans = i; // Index value is assigned to variable ans  
 min = Math.*min*(ans, min); // Find min out of the two variables  
 }  
 }  
 if (min == Integer.*MAX\_VALUE*) return -1; // If min value remains unchanged  
 return min; // Else return the min index  
 }  
}

**22. Problem: 1678. Goal Parser Interpretation**

You own a Goal Parser that can interpret a string command. The command consists of an alphabet of "G", "()" and/or "(al)" in some order. The Goal Parser will interpret "G" as the string "G", "()" as the string "o", and "(al)" as the string "al". The interpreted strings are then concatenated in the original order.

Given the string command, return *the Goal Parser's interpretation of*command.

Example 1:

Input: command = "G()(al)"

Output: "Goal"

Explanation: The Goal Parser interprets the command as follows:

G -> G

() -> o

(al) -> al

The final concatenated result is "Goal".

Example 2:

Input: command = "G()()()()(al)"

Output: "Gooooal"

Example 3:

Input: command = "(al)G(al)()()G"

Output: "alGalooG"

Constraints:

1 <= command.length <= 100

command consists of "G", "()", and/or "(al)" in some order.

**Solution:**

**My Solution:**

class Solution\_1678 {  
 public String interpret(String input) {  
 input = input.replaceAll("\\(\\)","o");  
 input = input.replaceAll("\\(al\\)","al");  
 return input;  
 }  
}  
  
// <https://leetcode.com/problems/goal-parser-interpretation/>

**Another Solution: 01**

class Solution {  
 public String interpret(String command) {  
 char[] str = command.toCharArray();  
 String fi="";  
 for(int i=0;i<str.length;i++){  
 if(str[i]=='G'){  
 fi=fi+str[i];  
 }  
 else if(str[i]=='(' && str[i+1]==')'){  
 fi=fi+'o';  
 }  
 else if(str[i]=='(' && str[i+1]=='a'){  
 fi= fi+"al";  
 }  
 }  
 return fi;  
 }  
}

**Another Solution: 02**

class Solution {  
 public String interpret(String command) {  
 StringBuilder S = new StringBuilder(command.length());  
 for(int i = 0 ; i < command.length() ; i++){  
 if(command.charAt(i)=='G') S.append('G');  
 if(command.charAt(i)=='('){  
 if(command.charAt(i+1)==')') {S.append('o'); i++;}  
 else{S.append("al"); i = i + 3;}  
 }  
 }  
 return S.toString();  
 }   
}

**Another Solution: 03**

class Solution {  
 public String interpret(String command) {  
 return command.replace("()", "o").replace("(al)", "al");  
 }   
}

**21. Problem: 771. Jewels and Stone**

You're given strings jewels representing the types of stones that are jewels, and stones representing the stones you have. Each character in stones is a type of stone you have. You want to know how many of the stones you have are also jewels.

Letters are case sensitive, so "a" is considered a different type of stone from "A".

Example 1:

Input: jewels = "aA", stones = "aAAbbbb"

Output: 3

Example 2:

Input: jewels = "z", stones = "ZZ"

Output: 0

Constraints:

1 <= jewels.length, stones.length <= 50

jewels and stones consist of only English letters.

All the characters of jewels are unique.

**Solution:**

**My Solution:**

class Solution\_771 {  
 public int numJewelsInStones(String jewels, String stones) {  
 int s = 0;  
 for(int i = 0 ; i < jewels.length() ; i++){  
 for(int j = 0 ; j < stones.length() ; j++){  
 if (jewels.charAt(i) == stones.charAt(j)){  
 s += 1;  
 //System.out.println(jewels.charAt(i) + " " + stones.charAt(j));  
 }  
 }  
 }  
 return s;  
 }  
}  
  
// <https://leetcode.com/problems/jewels-and-stones/submissions/>

**Another Solution: 01**

class Solution {  
 public int numJewelsInStones(String jewels, String stones) {  
 int num = 0;  
 for (int i = 0 ; i < stones.length(); i ++) {  
 if(jewels.indexOf(stones.charAt(i)) != -1) {  
 num++;  
 }  
 }  
 return num;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int numJewelsInStones(String J, String S) {  
 if(J.isEmpty()) return 0;  
 int cnt = 0;  
 for(int i = 0 ; i < S.length() ; i++) {  
 if(J.indexOf(S.charAt(i)) != -1) cnt++;  
 }  
 return cnt;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int numJewelsInStones(String jewels, String stones) {  
 int count=0;  
 for(char c:stones.toCharArray()){  
 if(jewels.indexOf(c)!=-1)count++;  
 }  
 return count;  
 }  
}

**Day 04-1470, 1672, 1431, 2367, 2057.**

**20. Problem: 2057. Smallest Index with equal value**

Given a **0-indexed** integer array nums, return *the****smallest****index*i*of*nums*such that*i mod 10 == nums[i]*, or*-1*if such index does not exist*.

x mod y denotes the **remainder** when x is divided by y.

**Example 1:**

**Input:** nums = [0,1,2]

**Output:** 0

**Explanation:**

i=0: 0 mod 10 = 0 == nums[0].

i=1: 1 mod 10 = 1 == nums[1].

i=2: 2 mod 10 = 2 == nums[2].

All indices have i mod 10 == nums[i], so we return the smallest index 0.

**Example 2:**

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

**Output:** 2

**Explanation:**

i=0: 0 mod 10 = 0 != nums[0].

i=1: 1 mod 10 = 1 != nums[1].

i=2: 2 mod 10 = 2 == nums[2].

i=3: 3 mod 10 = 3 != nums[3].

2 is the only index which has i mod 10 == nums[i].

**Example 3:**

**Input:** nums = [1,2,3,4,5,6,7,8,9,0]

**Output:** -1

**Explanation:** No index satisfies i mod 10 == nums[i].

**Constraints:**

1 <= nums.length <= 100

0 <= nums[i] <= 9

**Solution:**

**My Solution:**

package O1\_easy.day\_04;  
  
public class O20\_SmallestIndexWithEqualValue\_2057 {  
 public static void main(String[] args) {  
 Solution\_2057 solution\_2057 = new Solution\_2057();  
 int[] arr = {0, 1, 2};  
 int[] arr2 = {4, 3, 2, 1};  
 int[] arr3 = {1, 2, 3, 4, 5, 6, 7, 8, 9, 0};  
 System.*out*.println(solution\_2057.smallestEqual(arr));  
 System.*out*.println(solution\_2057.smallestEqual(arr2));  
 System.*out*.println(solution\_2057.smallestEqual(arr3));  
 }  
}  
  
class Solution\_2057 {  
 public int smallestEqual(int[] nums) {  
 for (int i = 0; i < nums.length; i++) {  
 if (i % 10 == nums[i]) {  
 return i;  
 }  
 }  
 return -1;  
 }  
}  
  
// <https://leetcode.com/problems/smallest-index-with-equal-value/>

**Another Solution: 01**

class Solution {  
 public int smallestEqual(int[] a) {  
 for (int d1 = 0; d1 <= 9; d1++)  
 for (int d2 = 0; d2 <= 9 && 10 \* d1 + d2 < a.length; d2++)  
 if (d2 == a[d1 \* 10 + d2]) return d1 \* 10 + d2;  
 return -1;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int smallestEqual(int[] n) {  
 int k = n.length;  
 for (int i = 0; i < k; i++) {  
 if (i % 10 == n[i]) return i;  
 }  
 return -1;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int smallestEqual(int[] nums) {  
 for (int i = 0; i < nums.length; i++) {  
 if (i % 10 == nums[i]) {  
 return i;  
 }  
 }  
 return -1;  
 }  
}

**19. Problem: 2367. Number of Arithmetic Triplets**

You are given a **0-indexed**, **strictly increasing** integer array nums and a positive integer diff. A triplet (i, j, k) is an **arithmetic triplet** if the following conditions are met:

i < j < k,

nums[j] - nums[i] == diff, and

nums[k] - nums[j] == diff.

Return *the number of unique****arithmetic triplets****.*

**Example 1:**

**Input:** nums = [0,1,4,6,7,10], diff = 3

**Output:** 2

**Explanation:**

(1, 2, 4) is an arithmetic triplet because both 7 - 4 == 3 and 4 - 1 == 3.

(2, 4, 5) is an arithmetic triplet because both 10 - 7 == 3 and 7 - 4 == 3.

**Example 2:**

**Input:** nums = [4,5,6,7,8,9], diff = 2

**Output:** 2

**Explanation:**

(0, 2, 4) is an arithmetic triplet because both 8 - 6 == 2 and 6 - 4 == 2.

(1, 3, 5) is an arithmetic triplet because both 9 - 7 == 2 and 7 - 5 == 2.

**Constraints:**

3 <= nums.length <= 200

0 <= nums[i] <= 200

1 <= diff <= 50

nums is **strictly** increasing.

**Solution:**

**My Solution:**

import java.util.HashSet;  
import java.util.Set;  
import java.util.stream.IntStream;  
  
public class O19\_NumberOfArithmeticTriplets\_2367 {  
 public static void main(String[] args) {  
 Solution\_2367 solution\_2367 = new Solution\_2367();  
 int[] num = {0, 1, 4, 6, 7, 10};  
 int[] num2 = {4, 5, 6, 7, 8, 9};  
 System.*out*.println(solution\_2367.arithmeticTriplets(num, 3));  
 System.*out*.println(solution\_2367.arithmeticTriplets(num2, 2));  
 }  
}  
  
class Solution\_2367 {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 int t = 0;  
 for (int i = 0; i < nums.length; i++) {  
 for (int j = 0; j < nums.length; j++) {  
 for (int k = 0; k < nums.length; k++) {  
 if (i != j && j != k && i < j && j < k && nums[j] - nums[i] == diff && nums[k] - nums[j] == diff) {  
 t += 1;  
 }  
 }  
 }  
 }  
 return t;  
 }  
}  
  
// <https://leetcode.com/problems/number-of-arithmetic-triplets/>

**Another Solution: 01**

class Solution {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 int cnt = 0;  
 Set<Integer> seen = new HashSet<>();  
 for (int num : nums) {  
 if (seen.contains(num - diff) && seen.contains(num - diff \* 2)) {  
 ++cnt;  
 }  
 seen.add(num);  
 }  
 return cnt;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 int count = 0;  
 for (int i = 0; i < nums.length - 2; i++) {  
 for (int j = i + 1; j < nums.length - 1; j++) {  
 for (int k = j + 1; k < nums.length; k++) {  
 if (nums[j] - nums[i] == diff && nums[k] - nums[j] == diff) count++;  
 }  
 }  
 }  
 return count;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int arithmeticTriplets(int[] nums, int diff) {  
 Set<Integer> set = new HashSet<>();  
 for (int num : nums) {  
 set.add(num);  
 }  
 int ans = 0;  
 for (int num : nums) {  
 if ((set.contains(num + diff) && set.contains(num + 2 \* diff))) {  
 ans++;  
 }  
 }  
 return ans;  
 }  
}

**18. Problem: 1431. Kids with Greatest Number Of Candies**

There are n kids with candies. You are given an integer array candies, where each candies[i] represents the number of candies the ith kid has, and an integer extraCandies, denoting the number of extra candies that you have.

Return *a boolean array*result*of length*n*, where*result[i]*is*true*if, after giving the*ith*kid all the*extraCandies*, they will have the****greatest****number of candies among all the kids, or*false*otherwise*.

Note that **multiple** kids can have the **greatest** number of candies.

**Example 1:**

**Input:** candies = [2,3,5,1,3], extraCandies = 3

**Output:** [true,true,true,false,true]

**Explanation:** If you give all extraCandies to:

- Kid 1, they will have 2 + 3 = 5 candies, which is the greatest among the kids.

- Kid 2, they will have 3 + 3 = 6 candies, which is the greatest among the kids.

- Kid 3, they will have 5 + 3 = 8 candies, which is the greatest among the kids.

- Kid 4, they will have 1 + 3 = 4 candies, which is not the greatest among the kids.

- Kid 5, they will have 3 + 3 = 6 candies, which is the greatest among the kids.

**Example 2:**

**Input:** candies = [4,2,1,1,2], extraCandies = 1

**Output:** [true,false,false,false,false]

**Explanation:** There is only 1 extra candy.

Kid 1 will always have the greatest number of candies, even if a different kid is given the extra candy.

**Example 3:**

**Input:** candies = [12,1,12], extraCandies = 10

**Output:** [true,false,true]

**Constraints:**

n == candies.length

2 <= n <= 100

1 <= candies[i] <= 100

1 <= extraCandies <= 50

**Solution:**

**My Solution:**

import java.util.ArrayList;  
import java.util.Arrays;  
import java.util.List;  
import java.util.stream.Collectors;  
  
public class O18\_KidsWithGreatestNumberOfCandies\_1431 {  
 public static void main(String[] args) {  
 Solution\_1431 solution\_1431 = new Solution\_1431();  
 int[] arr = {2, 3, 5, 1, 3};  
 int[] arr2 = {4, 2, 1, 1, 2};  
 int[] arr3 = {12, 1, 12};  
 System.*out*.println(solution\_1431.kidsWithCandies(arr, 3));  
 System.*out*.println(solution\_1431.kidsWithCandies(arr2, 1));  
 System.*out*.println(solution\_1431.kidsWithCandies(arr3, 10));  
 }  
}  
  
class Solution\_1431 {  
 public List<Boolean> kidsWithCandies(int[] candies, int extraCandies) {  
 List<Boolean> result = new ArrayList<>();  
 for (int i = 0; i < candies.length; i++) {  
 boolean b = false;  
 for (int j = 0; j < candies.length; j++) {  
 if (i != j && candies[i] + extraCandies < candies[j]) {  
 b = false;  
 break;  
 } else {  
 b = true;  
 }  
 }  
 result.add(b);  
 }  
 return result;  
 }  
}  
  
// <https://leetcode.com/problems/kids-with-the-greatest-number-of-candies/>

**Another Solution: 01**

class Solution {  
 public List<Boolean> kidsWithCandies(int[] candies, int extraCandies) {  
 int max = Arrays.*stream*(candies).max().getAsInt();  
 return Arrays.*stream*(candies).mapToObj(candy -> candy + extraCandies >= max).collect(Collectors.*toList*());  
 }  
}

**Another Solution: 02**

class Solution {  
 public List<Boolean> kidsWithCandies(int[] cs, int e) {  
 int max = 0;  
 List<Boolean> res = new ArrayList<>();  
 for (int n : cs) max = Math.*max*(n, max);  
 for (int n : cs) res.add(n + e >= max);  
 return res;  
 }  
}

**Another Solution: 03**

class Solution {  
 public List<Boolean> kidsWithCandies(int[] candies, int extraCandies) {  
 List<Boolean> ans = new ArrayList<>(candies.length);  
 int max = 0;  
 for (int candy : candies) {  
 max = Math.*max*(candy, max);  
 }  
 for (int candy : candies) {  
 ans.add(candy + extraCandies >= max);  
 }  
 return ans;  
 }  
}

**17. Problem: 1672. Richest Customer Wealth**

You are given an m x n integer grid accounts where accounts[i][j] is the amount of money the i​​​​​​​​​​​th​​​​ customer has in the j​​​​​​​​​​​th​​​​ bank. Return*the****wealth****that the richest customer has.*

A customer's **wealth** is the amount of money they have in all their bank accounts. The richest customer is the customer that has the maximum **wealth**.

**Example 1:**

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

**Output:** 6

**Explanation:**

1st customer has wealth = 1 + 2 + 3 = 6

2nd customer has wealth = 3 + 2 + 1 = 6

Both customers are considered the richest with a wealth of 6 each, so return 6.

**Example 2:**

**Input:** accounts = [[1,5],[7,3],[3,5]]

**Output:** 10

**Explanation**:

1st customer has wealth = 6

2nd customer has wealth = 10

3rd customer has wealth = 8

The 2nd customer is the richest with a wealth of 10.

**Example 3:**

**Input:** accounts = [[2,8,7],[7,1,3],[1,9,5]]

**Output:** 17

**Constraints:**

m == accounts.length

n == accounts[i].length

1 <= m, n <= 50

1 <= accounts[i][j] <= 100

**Solution:**

**My Solution:**

import java.util.Arrays;  
  
public class O17\_RichestCustomerWealth\_1672 {  
 public static void main(String[] args) {  
 Solution\_1672 solution\_1672 = new Solution\_1672();  
 int[][] arr = {{1, 2, 3}, {3, 2, 1}};  
 int[][] arr2 = {{1, 5}, {7, 3}, {3, 5}};  
 int[][] arr3 = {{2, 8, 7}, {7, 1, 3}, {1, 9, 5}};  
 System.*out*.println(solution\_1672.maximumWealth(arr));  
 System.*out*.println(solution\_1672.maximumWealth(arr2));  
 System.*out*.println(solution\_1672.maximumWealth(arr3));  
 }  
}  
  
class Solution\_1672 {  
 public int maximumWealth(int[][] accounts) {  
 int max = 0;  
 for (int i = 0; i < accounts.length; i++) {  
 int a = wealth(accounts[i]);  
 if (a > max) {  
 max = a;  
 }  
 }  
 return max;  
 }  
  
 public int wealth(int[] a) {  
 int sum = 0;  
 for (int i = 0; i < a.length; i++) {  
 sum += a[i];  
 }  
 return sum;  
 }  
}  
  
// <https://leetcode.com/problems/richest-customer-wealth/submissions/>

**Another Solution: 01**

class Solution {  
 public int maximumWealth(int[][] accounts) {  
 int temp = 0;  
 for (int i = 0; i < accounts.length; i++) {  
 int sum = 0;  
 for (int j = 0; j < accounts[i].length; j++) {  
 sum = sum + accounts[i][j];  
 }  
 if (sum > temp) {  
 temp = sum;  
 }  
 }  
 return temp;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int maximumWealth(int[][] accounts) {  
 return Arrays.*stream*(accounts)  
 .mapToInt(i -> Arrays.*stream*(i).sum())  
 .max()  
 .getAsInt();  
 }  
}

**Another Solution: 03**

class Solution {  
 public int maximumWealth(int[][] accounts) {  
 var maxWealth = 0;  
 for (var customer : accounts) {  
 maxWealth = Math.*max*(maxWealth, Arrays.*stream*(customer).sum());  
 }  
 return maxWealth;  
 }  
}

**16. Problem: 1470. Shuffle the array**

Given the array nums consisting of 2n elements in the form [x1,x2,...,xn,y1,y2,...,yn].

*Return the array in the form* [x1,y1,x2,y2,...,xn,yn].

**Example 1:**

**Input:** nums = [2,5,1,3,4,7], n = 3

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

**Explanation:** Since x1=2, x2=5, x3=1, y1=3, y2=4, y3=7 then the answer is [2,3,5,4,1,7].

**Example 2:**

**Input:** nums = [1,2,3,4,4,3,2,1], n = 4

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

**Example 3:**

**Input:** nums = [1,1,2,2], n = 2

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

**Constraints:**

1 <= n <= 500

nums.length == 2n

1 <= nums[i] <= 10^3

**Solution:**

**My Solution:**

import java.util.Arrays;  
import java.util.stream.IntStream;  
  
public class O16\_ShuffleTheString\_1470 {  
 public static void main(String[] args) {  
 Solution\_1470 solution\_1470 = new Solution\_1470();  
 int[] arr = {2, 5, 1, 3, 4, 7};  
 int[] arr2 = {1, 2, 3, 4, 4, 3, 2, 1};  
 int[] arr3 = {1, 1, 2, 2};  
 System.*out*.println(Arrays.*toString*(solution\_1470.shuffle(arr, 3)));  
 System.*out*.println(Arrays.*toString*(solution\_1470.shuffle(arr2, 4)));  
 System.*out*.println(Arrays.*toString*(solution\_1470.shuffle(arr3, 2)));  
 }  
}  
  
class Solution\_1470 {  
 public int[] shuffle(int[] nums, int n) {  
 int[] arrR = new int[nums.length];  
 int t = 0;  
 for (int k = 0; k < nums.length; k += 2) {  
 arrR[k] = nums[t];  
 t++;  
 }  
 int t2 = n;  
 for (int l = 1; l < nums.length; l += 2) {  
 arrR[l] = nums[t2];  
 t2++;  
 }  
 return arrR;  
 }  
}  
  
// <https://leetcode.com/problems/shuffle-the-array/submissions/>

**Another Solution: 01**

class Solution {  
 public int[] shuffle(int[] nums, int n) {  
 int len = nums.length;  
 for (int i = n; i < len; i++) {  
 nums[i] = (nums[i] << 10) | nums[i - n];  
 }  
 int index = 0;  
 for (int i = n; i < len; i++, index += 2) {  
 nums[index] = nums[i] & 1023;  
 nums[index + 1] = nums[i] >>> 10;  
 }  
 return nums;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int[] shuffle(int[] nums, int n) {  
 return IntStream.*range*(0, 2 \* n).map(i -> nums[i / 2 + i % 2 \* n]).toArray();  
 }  
}

**Another Solution: 03**

class Solution {  
 public int[] shuffle(int[] nums, int n) {  
 int[] res = new int[2 \* n];  
 for (int i = 0, j = n, idx = 0; idx < res.length; i++, j++) {  
 res[idx++] = nums[i];  
 res[idx++] = nums[j];  
 }  
 return res;  
 }  
}

**Day 03-2114, 1, 24, 415, 709.**

**15. Problem: 709. To Lower Case**

Given a string s, return the string after replacing every uppercase letter with the same lowercase letter.

**Example 1:**

**Input:** s = "Hello"

**Output:** "hello"

**Example 2:**

**Input:** s = "here"

**Output:** "here"

**Example 3:**

**Input:** s = "LOVELY"

**Output:** "lovely"

**Constraints:**

1 <= s.length <= 100

s consists of printable ASCII characters.

**Solution:**

**My Solution:**

public class O15\_ToLowerCase\_709 {  
 public static void main(String[] args) {  
 Solution\_709 solution\_709 = new Solution\_709();  
 String s = "Hello";  
 System.*out*.println(solution\_709.interpret(s));  
 }  
}  
  
class Solution\_709 {  
 public String interpret(String command) {  
 return command.toLowerCase();  
 }  
}  
  
// <https://leetcode.com/problems/to-lower-case/>

**Another Solution: 01**

class Solution\_709 {  
 public String toLowerCase(String str) {  
 char[] a = str.toCharArray();  
 for (int i = 0; i < a.length; i++)  
 if ('A' <= a[i] && a[i] <= 'Z')  
 a[i] = (char) (a[i] - 'A' + 'a');  
 return new String(a);  
 }  
}

**Another Solution: 02**

class Solution\_709 {  
 public String toLowerCase(String s) {  
 char[] a = s.toCharArray();  
 IntStream.*range*(0, a.length).filter(i -> 'A' <= a[i] && a[i] <= 'Z').forEach(i -> a[i] = (char) (a[i] - 'A' + 'a'));  
 return new String(a);  
 }  
}

**Another Solution: 03**

class Solution {  
 public String toLowerCase(String s) {  
 StringBuilder str = new StringBuilder();  
 for (int i = 0; i < s.length(); i++) {  
 if (s.charAt(i) >= 65 && s.charAt(i) <= 90) {  
 str.append((char) (s.charAt(i) + 32));  
 } else {  
 str.append(s.charAt(i));  
 }  
 }  
 return str.toString();  
 }  
}

**14. Problem: 415. Add String**

Given two non-negative integers, num1 and num2 represented as string, return *the sum of* num1 *and* num2 *as a string*.

You must solve the problem without using any built-in library for handling large integers (such as BigInteger). You must also not convert the inputs to integers directly.

**Example 1:**

**Input:** num1 = "11", num2 = "123"

**Output:** "134"

**Example 2:**

**Input:** num1 = "456", num2 = "77"

**Output:** "533"

**Example 3:**

**Input:** num1 = "0", num2 = "0"

**Output:** "0"

**Constraints:**

1 <= num1.length, num2.length <= 104

num1 and num2 consist of only digits.

num1 and num2 don't have any leading zeros except for the zero itself.

**Solution:**

**My Solution:**

import java.math.BigInteger;  
  
public class O14\_AddString\_415 {  
 public static void main(String[] args) {  
 Solution\_415 solution\_415 = new Solution\_415();  
 String s = "654615";  
 String s2 = "654615";  
 System.*out*.println(solution\_415.addStrings(s, s2));  
 }  
}  
  
class Solution\_415 {  
 public String addStrings(String num1, String num2) {  
 BigInteger bigInteger = new BigInteger(num1);  
 BigInteger bigInteger2 = new BigInteger(num2);  
 return String.*valueOf*(bigInteger2.add(bigInteger));  
 }  
}  
  
// <https://leetcode.com/problems/add-strings/submissions/>

**Another Solution: 01**

class Solution {  
 public String addStrings(String num1, String num2) {  
 int i = num1.length() - 1, j = num2.length() - 1, carry = 0;  
 StringBuilder sb = new StringBuilder();  
  
 while (i >= 0 || j >= 0 || carry != 0) {  
 if (i >= 0) carry += num1.charAt(i--) - '0';  
 if (j >= 0) carry += num2.charAt(j--) - '0';  
 sb.append(carry % 10);  
 carry /= 10;  
 }  
 return sb.reverse().toString();  
 }  
}

**Another Solution: 02**

class Solution {  
 public String addStrings(String num1, String num2) {  
 int carry = 0;  
 int i = num1.length() - 1, j = num2.length() - 1;  
 StringBuilder sb = new StringBuilder();  
 while (i >= 0 || j >= 0) {  
 int n1 = 0, n2 = 0;  
 if (i >= 0) {  
 n1 = num1.charAt(i) - '0';  
 }  
 if (j >= 0) {  
 n2 = num2.charAt(j) - '0';  
 }  
 int sum = n1 + n2 + carry;  
 carry = sum / 10;  
 sb.append(sum % 10);  
 i--;  
 j--;  
 }  
 if (carry != 0) {  
 sb.append(carry);  
 }  
 return sb.reverse().toString();  
 }  
}

**Another Solution: 03**

public class Solution {  
 public String addStrings(String num1, String num2) {  
 int i = num1.length() - 1;  
 int j = num2.length() - 1;  
 int carry = 0;  
 char[] num1Array = num1.toCharArray();  
 char[] num2Array = num2.toCharArray();  
 StringBuilder sb = new StringBuilder();  
 while (i >= 0 || j >= 0 || carry == 1) {  
 int a = i >= 0 ? (num1Array[i--] - '0') : 0;  
 int b = j >= 0 ? (num2Array[j--] - '0') : 0;  
 int sum = a + b + carry;  
 sb.insert(0, sum % 10);  
 carry = sum / 10;  
 }  
 return sb.toString();  
 }  
}  
  
*/\*\*  
 \* Complexity Analysis  
 \* Time Complexity: `O(m + n)` (Average Case) and `O(m + n)` (Worst Case) where `m` and `n` are the total number of characters  
 \* in the first and second input respectively. The algorithm evaluate each character for potential carry.  
 \*  
 \* Auxiliary Space: `O(m + n)` space is used where `m` and `n` are the total number of characters in the first and second input respectively.  
 \* Converting both input to character array required extra space.  
 \*  
 \* Algorithm  
 \* Approach: Iterative  
 \* \* The while loop will run as long as there are characters left in one of the strings or when there is a carry in remaining.  
 \* Starting from right to left, each character is converted to integer by the mean of offsetting its ASCII value.  
 \* If the shorter string is exhausted first, the value will be forced to `0` as default from there onwards.  
 \* Sum for that particular position is conveniently calculated and a modulus of `10` will extract the digit portion in case the sum is bigger than 10.  
 \* Carry in is extracted by flooring the number after division by `10`. StringBuilder is used due to its efficiently in inserting character to  
 \* existing StringBuilder object. If normal String is used then each insertion by + operation will have to copy over the immutable String object which is highly inefficient*

**13. Problem: 26. Remove Duplicates From sorted array**

Given an integer array nums sorted in **non-decreasing order**, remove the duplicates [**in-place**](https://en.wikipedia.org/wiki/In-place_algorithm) such that each unique element appears only **once**. The **relative order** of the elements should be kept the **same**.

Since it is impossible to change the length of the array in some languages, you must instead have the result be placed in the **first part** of the array nums. More formally, if there are k elements after removing the duplicates, then the first k elements of nums should hold the final result. It does not matter what you leave beyond the first k elements.

Return k after placing the final result in the first k slots of nums.

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.

**Custom Judge:**

The judge will test your solution with the following code:

int[] nums = [...]; // Input array

int[] expectedNums = [...]; // The expected answer with correct length

int k = removeDuplicates(nums); // Calls your implementation

assert k == expectedNums.length;

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

assert nums[i] == expectedNums[i];

}

If all assertions pass, then your solution will be **accepted**.

**Example 1:**

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

**Output:** 2, nums = [1,2,\_]

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

It does not matter what you leave beyond the returned k (hence they are underscores).

**Example 2:**

**Input:** nums = [0,0,1,1,1,2,2,3,3,4]

**Output:** 5, nums = [0,1,2,3,4,\_,\_,\_,\_,\_]

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

It does not matter what you leave beyond the returned k (hence they are underscores).

**Constraints:**

1 <= nums.length <= 3 \* 104

-100 <= nums[i] <= 100

nums is sorted in **non-decreasing** order.

**Solution:**

**My Solution:**

import java.util.\*;  
  
public class O13\_RemoveDuplicateFromsortedArray\_26 {  
 public static void main(String[] args) {  
 Solution solution = new Solution();  
 int[] arr = {1, 1, 2};  
 int[] arr2 = {0, 0, 1, 1, 1, 2, 2, 3, 3, 4};  
 System.*out*.println(solution.removeDuplicates(arr));  
 System.*out*.println(solution.removeDuplicates(arr2));  
 }  
}  
  
class Solution {  
 public int removeDuplicates(int[] nums) {  
 int[] temp = new int[nums.length];  
 int j = 0;  
 for (int i = 0; i < nums.length - 1; i++) {  
 if (nums[i] != nums[i + 1]) {  
 temp[j++] = nums[i];  
 }  
 }  
  
 temp[j++] = nums[nums.length - 1];  
  
 // Changing original array  
 for (int i = 0; i < j; i++) {  
 nums[i] = temp[i];  
 }  
 return j;  
 }  
}  
  
// <https://leetcode.com/problems/remove-duplicates-from-sorted-array/>

**Another Solution: 01**

class Solution {  
 public int removeDuplicates(int[] nums) {  
 int i = 0;  
 for (int n : nums)  
 if (i == 0 || n > nums[i - 1])  
 nums[i++] = n;  
 return i;  
 }  
}  
  
// And to not need the i ==0check in the loop:  
  
class Solution {  
 public int removeDuplicates(int[] nums) {  
 int i = nums.length > 0 ? 1 : 0;  
 for (int n : nums)  
 if (n > nums[i - 1])  
 nums[i++] = n;  
 return i;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int removeDuplicates(int[] nums) {  
 int pos = 0;  
 for (int num : nums) {  
 if (nums[pos] != num) {  
 nums[++pos] = num;  
 }  
 }  
 return pos + 1;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int removeDuplicates(int[] A) {  
 if (A.length == 0) return 0;  
 int j = 0;  
 for (int i = 0; i < A.length; i++)  
 if (A[i] != A[j]) A[++j] = A[i];  
 return ++j;  
 }  
}

**Another Solution: 03**

Duplicate count + Print Unique value using Hashmap

class Solution {  
 public int removeDuplicates(int[] nums) {

HashMap<Integer, Integer> hashmap = new HashMap<>();

int duplicateCount = 0;  
for (int i = 1; i < nums.length; i++) {  
 if (nums[i] == nums[i - 1]) {  
 duplicateCount++;  
 }  
 nums[i - duplicateCount] = nums[i];  
  
 hashmap.put(nums[i], i); // Value of nums insert in Hashmap as key and index as value  
 // hashmap.put(i, nums[i]); this will not work , key can not be duplicate, value can  
}  
System.*out*.println(hashmap.keySet()); // output: [0, 1, 2, 3, 4]  
System.*out*.println(hashmap.values()); // output: [1, 4, 6, 8, 9]  
return nums.length - duplicateCount;

}

**12. Problem: 01. Two Sum**

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

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

You can return the answer in any order.

**Example 1:**

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

**Output:** [0,1]

**Explanation:** Because nums[0] + nums[1] == 9, we return [0, 1].

**Example 2:**

**Input:** nums = [3,2,4], target = 6

**Output:** [1,2]

**Example 3:**

**Input:** nums = [3,3], target = 6

**Output:** [0,1]

**Constraints:**

2 <= nums.length <= 104

-109 <= nums[i] <= 109

-109 <= target <= 109

**Only one valid answer exists.**

Follow-up: Can you come up with an algorithm that is less than O(n2) time complexity?

**Solution:**

**My Solution:**

import java.util.Arrays;  
import java.util.HashMap;  
import java.util.Map;  
  
public class O12\_TwoSum\_1 {  
 public static void main(String[] args) {  
 Solution\_1 solution\_1 = new Solution\_1();  
 int[] arr = {2, 7, 11, 15};  
 int[] arr2 = {3, 2, 4};  
 System.*out*.println(Arrays.*toString*(solution\_1.twoSum(arr, 9)));  
 System.*out*.println(Arrays.*toString*(solution\_1.twoSum(arr2, 6)));  
 }  
}  
  
class Solution\_1 {  
 public int[] twoSum(int[] nums, int target) {  
 int[] result = new int[2];  
 for (int i = 0; i < nums.length; i++) {  
 for (int j = 0; j < nums.length; j++) {  
 if (i != j && nums[i] + nums[j] == target) {  
 result[0] = i;  
 result[1] = j;  
 break;  
 }  
 }  
 }  
 return result;  
 }  
}  
  
// <https://leetcode.com/problems/two-sum/submissions/>

**Another Solution: 01**

class Solution {  
 public int[] twoSum(int[] numbers, int target) {  
 int[] result = new int[2];  
 Map<Integer, Integer> map = new HashMap<Integer, Integer>();  
 for (int i = 0; i < numbers.length; i++) {  
 if (map.containsKey(target - numbers[i])) {  
 result[1] = i;  
 result[0] = map.get(target - numbers[i]);  
 return result;  
 }  
 map.put(numbers[i], i);  
 }  
 return result;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int[] twoSum(int[] nums, int target) {  
 HashMap<Integer, Integer> seen = new HashMap<>();  
 for (int i = 0; i < nums.length; ++i) {  
 int b = nums[i], a = target - b;  
 if (seen.containsKey(a)) return new int[]{seen.get(a), i}; // Found pair of (a, b), so that a + b = target  
 seen.put(b, i);  
 }  
 return new int[]{};  
 }  
}

**Another Solution: 03**

class Solution {  
 //O(nlogn)  
 public int[] twoSum\_n2(int[] nums, int target) {  
 if (nums == null) return null;  
 int[] nums2 = Arrays.*copyOf*(nums, nums.length);  
 Arrays.*sort*(nums2);  
 int a = 0, b = 0;  
 int start = 0, end = nums2.length - 1;  
 //find two nums  
 while (start < end) {  
 int sum = nums2[start] + nums2[end];  
 if (sum < target) start++;  
 else if (sum > target) end--;  
 else {  
 a = nums2[start];  
 b = nums2[end];  
 break;  
 }  
 }  
 //find the index of two numbers  
 int[] res = new int[2];  
 for (int i = 0; i < nums.length; i++) {  
 if (nums[i] == a) {  
 res[0] = i;  
 break;  
 }  
 }  
 if (a != b) {  
 for (int i = 0; i < nums.length; i++) {  
 if (nums[i] == b) {  
 res[1] = i;  
 break;  
 }  
 }  
 } else {  
 for (int i = 0; i < nums.length; i++) {  
 if (nums[i] == b && i != res[0]) {  
 res[1] = i;  
 break;  
 }  
 }  
 }  
 return res;  
 }  
}

**11. Problem: 2114. Maximum Number of Words found in Sentence**

A sentence is a list of words that are separated by a single space with no leading or trailing spaces.

You are given an array of strings sentences, where each sentences[i] represents a single sentence.

Return *the maximum number of words that appear in a single sentence*.

Example 1:

Input: sentences = ["alice and bob love leetcode", "i think so too", "this is great thanks very much"]

Output: 6

Explanation:

- The first sentence, "alice and bob love leetcode", has 5 words in total.

- The second sentence, "i think so too", has 4 words in total.

- The third sentence, "this is great thanks very much", has 6 words in total.

Thus, the maximum number of words in a single sentence comes from the third sentence, which has 6 words.

Example 2:

Input: sentences = ["please wait", "continue to fight", "continue to win"]

Output: 3

Explanation: It is possible that multiple sentences contain the same number of words.

In this example, the second and third sentences (underlined) have the same number of words.

Constraints:

1 <= sentences.length <= 100

1 <= sentences[i].length <= 100

sentences[i] consists only of lowercase English letters and ' ' only.

sentences[i] does not have leading or trailing spaces.

All the words in sentences[i] are separated by a single space.

**Solution:**

**My Solution:**

import java.util.Arrays;  
import java.util.stream.Stream;  
  
public class O11\_MaxNumberOfWordInSentence\_2114 {  
 public static void main(String[] args) {  
 Solution\_2114 solution\_2114 = new Solution\_2114();  
 String[] arr = {"alice and bob love leetcode", "i think so too", "this is great thanks very much"};  
 String[] arr2 = {"please wait", "continue to fight", "continue to win"};  
 System.*out*.println((solution\_2114.mostWordsFound(arr)));  
 System.*out*.println((solution\_2114.mostWordsFound(arr2)));  
 }  
}  
  
class Solution\_2114 {  
 public int mostWordsFound(String[] sentences) {  
 int max = 0;  
 for (int i = 0; i < sentences.length; i++) {  
 int c = most(sentences[i]);  
 if (c > max) {  
 max = c;  
 }  
 }  
 return max;  
 }  
  
 public int most(String s) {  
 int m = 0;  
 String[] strings = s.split(" ");  
 m = strings.length;  
 return m;  
 }  
}  
  
// <https://leetcode.com/problems/maximum-number-of-words-found-in-sentences/>

**Another Solution: 01**

class Solution {  
 public int mostWordsFound(String[] sentences) {  
 return Stream.*of*(sentences).mapToInt(s -> s.split(" ").length).max().getAsInt();  
 }  
}

**Another Solution: 02**

class Solution {  
 public int mostWordsFound(String[] sentences) {  
 int max = 0;  
 for (String s : sentences) {  
 max = Math.*max*(max, s.split(" ").length);  
 }  
 return max;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int mostWordsFound(String[] sentences) {  
 int max = 0;  
 for (String s : sentences) {  
 int x = s.indexOf(" "), count = 1;  
 while (x != -1) {  
 count++;  
 x = s.indexOf(" ", x + 1);  
 }  
 max = Math.*max*(count, max);  
 }  
 return max;  
 }  
}

**Day 02-1929, 1920, 1512, 1365, 1816.**

**10. Problem: 1816. Truncate Sentence**

A **sentence** is a list of words that are separated by a single space with no leading or trailing spaces. Each of the words consists of **only** uppercase and lowercase English letters (no punctuation).

For example, "Hello World", "HELLO", and "hello world hello world" are all sentences.

You are given a sentence s​​​​​​ and an integer k​​​​​​. You want to **truncate** s​​​​​​ such that it contains only the **first** k​​​​​​ words. Return s​​​​*​​ after****truncating****it.*

**Example 1:**

**Input:** s = "Hello how are you Contestant", k = 4

**Output:** "Hello how are you"

**Explanation:**

The words in s are ["Hello", "how" "are", "you", "Contestant"].

The first 4 words are ["Hello", "how", "are", "you"].

Hence, you should return "Hello how are you".

**Example 2:**

**Input:** s = "What is the solution to this problem", k = 4

**Output:** "What is the solution"

**Explanation:**

The words in s are ["What", "is" "the", "solution", "to", "this", "problem"].

The first 4 words are ["What", "is", "the", "solution"].

Hence, you should return "What is the solution".

**Example 3:**

**Input:** s = "chopper is not a tanuki", k = 5

**Output:** "chopper is not a tanuki"

**Constraints:**

1 <= s.length <= 500

k is in the range [1, the number of words in s].

s consist of only lowercase and uppercase English letters and spaces.

The words in s are separated by a single space.

There are no leading or trailing spaces.

**Solution:**

**My Solution:**

public class O10\_TruncateSentence\_1816 {  
 public static void main(String[] args) {  
 Solution\_1816 solution\_1816 = new Solution\_1816();  
 System.*out*.println(solution\_11816.truncateSentence("Hello how are you Contestant", 4));  
 }  
}  
class Solution\_1816 {  
 public String truncateSentence(String s, int k) {  
 String[] na = s.split(" ");  
 String newString = "";  
 for (int i = 0; i < k; i++) {  
 if (i != k - 1) {  
 newString += na[i] + " ";  
 } else {  
 newString += na[i];  
 }  
 }  
 return newString;  
 }  
}  
  
// <https://leetcode.com/problems/truncate-sentence/>

**Another Solution: 01**

//Approch 1:[using split]  
class Solution {  
 public String truncateSentence(String s, int k) {  
 String[] str = s.split(" ");  
 StringBuilder truncatedSentence = new StringBuilder();  
 for (int i = 0; i < k - 1; i++) {  
 truncatedSentence.append(str[i] + " ");  
 }  
 truncatedSentence.append(str[k - 1]); //because we don't want space for last word  
 return truncatedSentence.toString();  
 }  
}  
//Complexity:  
//Time:O(n) and Space:O(n)  
//Note: Split function will iterate over the string to split on the basis of "". thats why time is O(n) not O(k)

//Approch 2:[without split]  
class Solution {  
 public String truncateSentence(String s, int k) {  
 int idx = 0;  
 int spaceCount = 0;  
  
 while (idx < s.length() && spaceCount < k) {  
 if (s.charAt(idx) == ' ') spaceCount++;  
 idx++;  
 }  
 // if(spaceCount<k) means we have to include whole string  
 return spaceCount == k ? s.substring(0, idx - 1) : s;  
 }  
}  
//Complexity:  
//Time:O(n) and O(1) [Big O notation average time complexity is better than approch 1]

**Another Solution: 02**

class Solution {  
 public String truncateSentence(String s, int k) {  
 String[] words = s.split(" ");  
 StringBuilder sb = new StringBuilder(words[0]);  
 for (int i = 1; i < k; ++i) {  
 sb.append(" " + words[i]);  
 }  
 return sb.toString();  
 }  
}

**Another Solution: 03**

class Solution {  
 public String truncateSentence(String s, int k) {  
 int n = s.length();  
 int count = 0;  
 int i = 0;  
 while (i < n) {  
 if (s.charAt(i) == ' ') {  
 count++;  
 if (count == k)  
 return s.substring(0, i);  
 }  
 i++;  
 }  
 return s;  
 }  
}

**09. Problem: 1365. How many numbers are smaller than the current number**

Given the array nums, for each nums[i] find out how many numbers in the array are smaller than it. That is, for each nums[i] you have to count the number of valid j's such that j != i and nums[j] < nums[i].

Return the answer in an array.

Example 1:

Input: nums = [8,1,2,2,3]

Output: [4,0,1,1,3]

Explanation:

For nums[0]=8 there exist four smaller numbers than it (1, 2, 2 and 3).

For nums[1]=1 does not exist any smaller number than it.

For nums[2]=2 there exist one smaller number than it (1).

For nums[3]=2 there exist one smaller number than it (1).

For nums[4]=3 there exist three smaller numbers than it (1, 2 and 2).

Example 2:

Input: nums = [6,5,4,8]

Output: [2,1,0,3]

Example 3:

Input: nums = [7,7,7,7]

Output: [0,0,0,0]

Constraints:

2 <= nums.length <= 500

0 <= nums[i] <= 100

**Solution:**

**My Solution:**

import java.util.Arrays;  
import java.util.HashMap;  
import java.util.Map;  
  
public class O9\_Test {  
 public static void main(String[] args) {  
 Solution\_1365 solution\_1365 = new Solution\_1365();  
 int[] arr = {8, 1, 2, 2, 3};  
 int[] arr2 = {6, 5, 4, 8};  
 int[] arr3 = {7, 7, 7, 7};  
 System.*out*.println((Arrays.*toString*(solution\_1365.smallerNumbersThanCurrent(arr))));  
 System.*out*.println((Arrays.*toString*(solution\_1365.smallerNumbersThanCurrent(arr2))));  
 System.*out*.println((Arrays.*toString*(solution\_1365.smallerNumbersThanCurrent(arr3))));  
 }  
}  
  
class Solution\_1365 {  
 public int[] smallerNumbersThanCurrent(int[] nums) {  
 int[] result = new int[nums.length];  
 int count = 0;  
 for (int i = 0; i < nums.length; i++) {  
 for (int j = 0; j < nums.length; j++) {  
 if (nums[i] > nums[j]) {  
 count++;  
 }  
 }  
 result[i] = count;  
 count = 0;  
 }  
 return result;  
 }  
}  
  
// <https://leetcode.com/problems/how-many-numbers-are-smaller-than-the-current-number/submissions/>   
  
*/\*\*  
 \* Both i and j loop start from 0.  
 \* so that every element is compare to every element.  
 \*/*

**Another Solution: 01**

class Solution {  
 public int[] smallerNumbersThanCurrent(int[] nums) {  
 int[] answer = new int[nums.length];  
 int count;  
 for (int i = 0; i < nums.length; i++) {  
 count = 0;  
 for (int j = 0; j < nums.length; j++) {  
 if (i != j && nums[j] < nums[i])  
 count++;  
 }  
 answer[i] = count;  
 }  
 return answer;  
 }  
}

**Another Solution: 02**

class Solution {  
 public int[] smallerNumbersThanCurrent(int[] nums) {  
 int[] buck = new int[101];  
 for (int i = 0; i < nums.length; i++) {  
 buck[nums[i]] += 1;  
 }  
 for (int j = 1; j <= 100; j++) {  
 buck[j] += buck[j - 1];  
 }  
 for (int k = 0; k < nums.length; k++) {  
 int pos = nums[k];  
 nums[k] = pos == 0 ? 0 : buck[pos - 1];  
 }  
 return nums;  
 }  
}

**Another Solution: 03**

class Solution {  
 public int[] smallerNumbersThanCurrent(int[] nums) {  
 Map<Integer, Integer> map = new HashMap<>();  
 int[] copy = nums.clone();  
 Arrays.*sort*(copy);  
 for (int i = 0; i < nums.length; i++) {  
 map.putIfAbsent(copy[i], i);  
 }  
 for (int i = 0; i < nums.length; i++) {  
 copy[i] = map.get(nums[i]);  
 }  
 return copy;  
 }  
}

**08. Problem: 1512. Number of Good Pairs**

Given an array of integers nums, return *the number of****good pairs***.

A pair (i, j) is called *good* if nums[i] == nums[j] and i < j.

**Example 1:**

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

**Output:** 4

**Explanation:** There are 4 good pairs (0,3), (0,4), (3,4), (2,5) 0-indexed.

**Example 2:**

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

**Output:** 6

**Explanation:** Each pair in the array are *good*.

**Example 3:**

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

**Output:** 0

**Constraints:**

1 <= nums.length <= 100

1 <= nums[i] <= 100

Accepted

362,718

Submissions

411,274

**Solution:**

**My Solution:**

package O1\_easy.day\_02;  
  
import java.util.Arrays;  
import java.util.HashMap;  
  
public class O8\_NumberOfGoodPairs\_1512 {  
 public static void main(String[] args) {  
 Solution\_1470 solution\_1470 = new Solution\_1470();  
 int[] arr = {1, 2, 3, 1, 1, 3};  
 int[] arr2 = {1, 1, 1, 1};  
 int[] arr3 = {1, 2, 3};  
 System.*out*.println((solution\_1470.numIdenticalPairs(arr)));  
 System.*out*.println((solution\_1470.numIdenticalPairs(arr2)));  
 System.*out*.println((solution\_1470.numIdenticalPairs(arr3)));  
 }  
}  
  
class Solution\_1470 {  
 public int numIdenticalPairs(int[] nums) {  
 int count = 0;  
 for (int i = 0; i < nums.length; i++) {  
 for (int j = 1; j < nums.length; j++) {  
 if (nums[i] == nums[j] && i < j) {  
 count++;  
 }  
 }  
 }  
 return count;  
 }  
}

// <https://leetcode.com/problems/number-of-good-pairs/>

**Another Solution: 01**

class Solution1 {  
 public int numIdenticalPairs1(int[] A) {  
 int res = 0, count[] = new int[101];  
 for (int a : A) {  
 res += count[a]++;  
 }  
 return res;  
 }  
}

**Another Solution: 02**

class Solution2 {  
 public int numIdenticalPairs2(int[] guestList) {  
 HashMap<Integer, Integer> hm = new HashMap<>();  
 int ans = 0;  
 for (int friend : guestList) {  
 int friendCount = hm.getOrDefault(friend, 0);  
 ans += friendCount;  
 hm.put(friend, friendCount + 1);  
 }  
 return ans;  
 }  
}

**Another Solution: 03**

class Solution3 {  
 public int numIdenticalPairs3(int[] nums) {  
 int ans = 0;  
 int[] count = new int[101];  
 for (int n : nums)  
 count[n]++;  
 for (int n : count)  
 ans += (n \* (n - 1)) / 2;  
 return ans;  
 }  
}

**07. Problem: 2011. Final value of variable after performing operation**

There is a programming language with only **four** operations and **one** variable X:

++X and X++ **increments** the value of the variable X by 1.

--X and X-- **decrements** the value of the variable X by 1.

Initially, the value of X is 0.

Given an array of strings operations containing a list of operations, return *the****final****value of*X *after performing all the operations*.

**Example 1:**

**Input:** operations = ["--X","X++","X++"]

**Output:** 1

**Explanation:** The operations are performed as follows:

Initially, X = 0.

--X: X is decremented by 1, X = 0 - 1 = -1.

X++: X is incremented by 1, X = -1 + 1 = 0.

X++: X is incremented by 1, X = 0 + 1 = 1.

**Example 2:**

**Input:** operations = ["++X","++X","X++"]

**Output:** 3

**Explanation:** The operations are performed as follows:

Initially, X = 0.

++X: X is incremented by 1, X = 0 + 1 = 1.

++X: X is incremented by 1, X = 1 + 1 = 2.

X++: X is incremented by 1, X = 2 + 1 = 3.

**Example 3:**

**Input:** operations = ["X++","++X","--X","X--"]

**Output:** 0

**Explanation:** The operations are performed as follows:

Initially, X = 0.

X++: X is incremented by 1, X = 0 + 1 = 1.

++X: X is incremented by 1, X = 1 + 1 = 2.

--X: X is decremented by 1, X = 2 - 1 = 1.

X--: X is decremented by 1, X = 1 - 1 = 0.

**Constraints:**

1 <= operations.length <= 100

operations[i] will be either "++X", "X++", "--X", or "X--".

**Solution:**

**My Solution:**

import java.util.Arrays;  
  
public class O7\_Test {  
 public static void main(String[] args) {  
 Solution\_2011 solution\_2011 = new Solution\_2011();  
 String[] arr = {"--X", "X++", "X++"};  
 String[] arr2 = {"X++", "++X", "--X", "X--"};  
 String[] arr3 = {"++X", "++X", "X++"};  
 System.*out*.println(solution\_2011.finalValueAfterOperations(arr));  
 System.*out*.println(solution\_2011.finalValueAfterOperations(arr2));  
 System.*out*.println(solution\_2011.finalValueAfterOperations(arr3));  
  
 }  
}  
  
class Solution\_2011 {  
 public int finalValueAfterOperations(String[] operations) {  
  
 int result = 0;  
 for (int i = 0; i < operations.length; i++) {  
 if (operations[i].equals("++X")) {  
 result = 1 + result;  
 } else if (operations[i].equals("--X")) {  
 result = result - 1;  
 } else if (operations[i].equals("X++")) {  
 result = result + 1;  
 } else if (operations[i].equals("X--")) {  
 result = result - 1;  
 }  
 }  
 return result;  
 }  
}

// <https://leetcode.com/problems/build-array-from-permutation/>

**Another Solution: 01**

class Solution1 {  
 public int finalValueAfterOperations1(String[] operations) {  
 int val = 0;  
 for (int i = 0; i < operations.length; i++) {  
 if (operations[i].charAt(1) == '+') val++;  
 else val--;  
 }  
 return val;  
 }  
}

**Another Solution: 02**

class Solution2 {  
 public int finalValueAfterOperations2(String[] operations) {  
 int res = 0;  
 for (String operation : operations) {  
 res += operation.charAt(1) == '+' ? 1 : -1;  
 }  
 return res;  
 }  
}

**Another Solution: 03**

public static int finalValueAfterOperations3(String[] operations) {  
 return Arrays.*stream*(operations, 0, operations.length)  
 .mapToInt(operation -> operation.charAt(1) == '+' ? 1 : -1)  
 .sum();  
 }

**06. Problem: 1929. Concatenation of Array**

Given an integer array nums of length n, you want to create an array ans of length 2n where ans[i] == nums[i] and ans[i + n] == nums[i] for 0 <= i < n (**0-indexed**).

Specifically, ans is the **concatenation** of two nums arrays.

Return *the array*ans.

**Example 1:**

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

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

**Explanation:** The array ans is formed as follows:

- ans = [nums[0],nums[1],nums[2],nums[0],nums[1],nums[2]]

- ans = [1,2,1,1,2,1]

**Example 2:**

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

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

**Explanation:** The array ans is formed as follows:

- ans = [nums[0],nums[1],nums[2],nums[3],nums[0],nums[1],nums[2],nums[3]]

- ans = [1,3,2,1,1,3,2,1]

**Constraints:**

n == nums.length

1 <= n <= 1000

1 <= nums[i] <= 1000

**Solution:**

**My Solution:**

public class O6\_ConcatenationOfArray\_1929 {  
 public static void main(String[] args) {  
 Solution\_1929 solution\_1929 = new Solution\_1929();  
 int[] arr = {1, 3, 2, 1};  
 System.*out*.println(Arrays.*toString*(solution\_1929.getConcatenation(arr)));  
 }  
}  
class Solution\_1929 {  
 public int[] getConcatenation(int[] nums) {  
 int[] newAnswer = new int[nums.length \* 2];  
 int givenArrayLength = nums.length;  
 for (int i = 0; i < nums.length; i++) {  
 newAnswer[i] = nums[i];  
 newAnswer[i + givenArrayLength] = nums[i];  
 }  
 return newAnswer;  
 }  
}  
  
// https://leetcode.com/problems/concatenation-of-array/  
  
*/\*\*  
 \* (int i = 0; i < nums.length; i++) --> must be i<nums.length or i<=nums.length-1  
 \*/*

**Another Solution: 01**

public int[] getConcatenation(int[] nums) {  
 int[] result = new int[nums.length \* 2];  
 for (int i = 0; i < nums.length; i++)  
 result[i + nums.length] = result[i] = nums[i];  
 return result;  
}

**Another Solution: 02**

public int[] getConcatenation(int[] nums) {  
 int[] ans = new int[nums.length \* 2];  
 for (int i = 0; i < nums.length; i++) {  
 ans[i] = nums[i];  
 ans[nums.length + i] = nums[i];  
 }  
 return ans;  
}

**Day 01- 9, 1480, 1108, 1662, 2235.**

**5. Problem: 1108. Defanging an IP Address**

Given a valid (IPv4) IP address, return a defanged version of that IP address.

A *defanged IP address* replaces every period "." with "[.]".

**Example 1:**

**Input:** address = "1.1.1.1"

**Output:** "1[.]1[.]1[.]1"

**Example 2:**

**Input:** address = "255.100.50.0"

**Output:** "255[.]100[.]50[.]0"

**Constraints:**

The given address is a valid IPv4 address.

**Solution:**

**My Solution:**

public class O5\_DefiningIpAddress\_1108 {  
 public static void main(String[] args) {  
 Solution\_1108 solution\_1108 = new Solution\_1108();  
 System.*out*.println(solution\_1108.defangIPaddr("1.1.1.1"));  
 }  
}  
  
class Solution\_1108 {  
 public String defangIPaddr(String address) {  
 return address.replace(".", "[.]");  
 }  
}

**Another Solution: 01**

// Another solution:  
class Solution {  
 public String defangIPaddr(String address) {  
 StringBuilder str = new StringBuilder();  
 for (int i = 0; i < address.length(); i++) {  
 if (address.charAt(i) == '.') {  
 str.append("[.]");  
 } else {  
 str.append(address.charAt(i));  
 }  
 }  
 return str.toString();  
 }  
}

**Another Solution: 02**

//Another Solution:  
class Solution {  
 public String defangIPaddr(String address) {  
 return address.replaceAll("\\.", "[.]");  
 }  
}

**Another Solution: 03**

String str = "";  
for(int itr = 0; itr < address.length(); itr++){  
 if(address.charAt(itr) == '.') str += "[.]";  
 else str += address.charAt(itr);  
}  
return str;

**04. Problem: 1662. Check If Two String array are Equivalent**

Given two string arrays word1 and word2, return true if the two arrays **represent** the same string, and false otherwise.

A string is **represented** by an array if the array elements concatenated **in order** forms the string.

**Example 1:**

**Input:** word1 = ["ab", "c"], word2 = ["a", "bc"]

**Output:** true

**Explanation:**

word1 represents string "ab" + "c" -> "abc"

word2 represents string "a" + "bc" -> "abc"

The strings are the same, so return true.

**Example 2:**

**Input:** word1 = ["a", "cb"], word2 = ["ab", "c"]

**Output:** false

**Example 3:**

**Input:** word1 = ["abc", "d", "defg"], word2 = ["abcddefg"]

**Output:** true

**Constraints:**

1 <= word1.length, word2.length <= 103

1 <= word1[i].length, word2[i].length <= 103

1 <= sum(word1[i].length), sum(word2[i].length) <= 103

word1[i] and word2[i] consist of lowercase letters.

**Solution:**

**My Solution:**

public class O4\_StringEquivalent\_1662 {  
 public static void main(String[] args) {  
 Solution\_1662 solution\_1662 = new Solution\_1662();  
 String[] word1 = {"a", "cb"};  
 String[] word2 = {"ab", "c"};  
 System.*out*.println(solution\_1662.arrayStringsAreEqual(word1, word2));  
 }  
}  
  
class Solution\_1662 {  
 public boolean arrayStringsAreEqual(String[] word1, String[] word2) {  
 String r1 = "";  
 for (int i = 0; i < word1.length; i++) {  
 r1 += word1[i];  
 }  
 System.*out*.println(r1);  
 String r2 = "";  
 for (int i = 0; i < word2.length; i++) {  
 r2 += word2[i];  
 }  
 System.*out*.println(r2);  
  
 if (r1.equals(r2)) {  
 return true;  
 } else {  
 return false;  
 }  
 }  
}  
  
// <https://leetcode.com/problems/check-if-two-string-arrays-are-equivalent/>

**Another Solution: 01**

class Solution {  
 public boolean arrayStringsAreEqual(String[] word1, String[] word2) {  
 return String.*join*("", word1).equals(String.*join*("", word2));  
 }  
}

**Another Solution: 02**

class Solution {  
 public boolean arrayStringsAreEqual(String[] word1, String[] word2) {  
 StringBuilder sb1 = new StringBuilder(), sb2 = new StringBuilder();  
 for (String word : word1)  
 sb1.append(word);  
  
 for (String word : word2)  
 sb2.append(word);  
  
 return sb1.toString().equals(sb2.toString());  
 }  
}

**Another Solution: 03**

class Solution {  
 public boolean arrayStringsAreEqual(String[] word1, String[] word2) {  
 int idx1 = 0, idx2 = 0, arrIdx1 = 0, arrIdx2 = 0;  
 while (arrIdx1 < word1.length && arrIdx2 < word2.length) {  
 if (word1[arrIdx1].charAt(idx1) != word2[arrIdx2].charAt(idx2)) return false;  
 if (idx1 == word1[arrIdx1].length() - 1) {  
 idx1 = 0;  
 arrIdx1++;  
 } else idx1++;  
 if (idx2 == word2[arrIdx2].length() - 1) {  
 idx2 = 0;  
 arrIdx2++;  
 } else idx2++;  
 }  
 return arrIdx1 == word1.length && arrIdx2 == word2.length;  
 }  
}

**Another Solution: 04**

class Solution {  
 public boolean arrayStringsAreEqual(String[] word1, String[] word2) {  
 int idx1 = 0, idx2 = 0, arrIdx1 = 0, arrIdx2 = 0;  
 while (arrIdx1 < word1.length && arrIdx2 < word2.length) {  
 if (word1[arrIdx1].charAt(idx1) != word2[arrIdx2].charAt(idx2)) return false;  
 idx1 = (++idx1) % word1[arrIdx1].length();  
 idx2 = (++idx2) % word2[arrIdx2].length();  
 if (idx1 == 0) arrIdx1++;  
 if (idx2 == 0) arrIdx2++;  
 }  
 return arrIdx1 == word1.length && arrIdx2 == word2.length;  
 }  
}

**03. Problem: 1480. Running Sum of 1d array**

Given an array nums. We define a running sum of an array as runningSum[i] = sum(nums[0]…nums[i]).

Return the running sum of nums.

**Example 1:**

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

**Output:** [1,3,6,10]

**Explanation:** Running sum is obtained as follows: [1, 1+2, 1+2+3, 1+2+3+4].

**Example 2:**

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

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

**Explanation:** Running sum is obtained as follows: [1, 1+1, 1+1+1, 1+1+1+1, 1+1+1+1+1].

**Example 3:**

**Input:** nums = [3,1,2,10,1]

**Output:** [3,4,6,16,17]

**Constraints:**

1 <= nums.length <= 1000

-10^6 <= nums[i] <= 10^6

**Solution:**

**My Solution:**

import java.util.Arrays;  
  
public class O3\_RunningSum1dArray\_1480 {  
 public static void main(String[] args) {  
 Solution\_1480 solution\_1480 = new Solution\_1480();  
 int[] nums = {1, 1, 1, 1, 1};  
 System.*out*.println(Arrays.toString(solution\_1480.runningSum(nums)));  
 int[] nums2 = {1, 2, 3, 4};  
 System.*out*.println(Arrays.toString(solution\_1480.runningSum(nums2)));  
 }  
}  
  
class Solution\_1480 {  
 public int[] runningSum(int[] nums) {  
 int[] result = new int[nums.length];  
 int sum = 0;  
 for (int i = 0; i < nums.length; i++) {  
 sum = sum + nums[i];  
 result[i] = sum;  
 }  
 return result;  
 }  
}  
  
 */\*\*  
 \* {1, 2, 3, 4}  
 \* <p>  
 \* Iteration: 1  
 \* sum = sum + num[i] | sum = 0 + 1 = 1  
 \* result[i] = sum | result[0] = 1  
 \* <p>  
 \* Iteration: 2  
 \* sum = 1 + 2 = 3 , result[1] = 3  
 \* <p>  
 \* Iteration: 3  
 \* sum = 3 + 3 = 6 , result[2] = 6  
 \* <p>  
 \* Iteration: 4  
 \* sum = 3 + 6 = 10 , result[3] = 10  
 \*/*// <https://leetcode.com/problems/running-sum-of-1d-array/>

**Another Solution: 01**

public int[] runningSum(int[] nums) {  
 // modify the input array, adding n[i] with n[i-1]  
 for (int i = 1; i < nums.length; i++) {  
 nums[i] += nums[i - 1];  
 }  
  
 // return the modified array  
 return nums;  
 }

**Another Solution: 02**

class Solution {  
 public int[] runningSum(int[] nums) {  
 return IntStream.range(0, nums.length).map(i -> i == 0 ? nums[i] : (nums[i] += nums[i - 1])).toArray();  
 }  
}

**Another Solution: 03**

**02. Problem: 9. Palindrome or not**

Given an integer x, return true if x is palindrome integer.

An integer is a **palindrome** when it reads the same backward as forward.

For example, 121 is a palindrome while 123 is not.

**Example 1:**

**Input:** x = 121

**Output:** true

**Explanation:** 121 reads as 121 from left to right and from right to left.

**Example 2:**

**Input:** x = -121

**Output:** false

**Explanation:** From left to right, it reads -121. From right to left, it becomes 121-. Therefore it is not a palindrome.

**Example 3:**

**Input:** x = 10

**Output:** false

**Explanation:** Reads 01 from right to left. Therefore it is not a palindrome.

**Constraints:**

-231 <= x <= 231 - 1

**Follow up: Could you solve it without converting the integer to a string?**

**Solution:**

**My Solution:**

package O1\_easy;  
  
public class O2\_Palindrome\_9 {  
 public static void main(String args[]) {  
 Solution\_9 solution = new Solution\_9();  
 System.*out*.println(solution.isPalindrome(121));  
 System.*out*.println(solution.isPalindrome(123));  
 }  
}  
  
class Solution\_9 {  
 public boolean isPalindrome(int x) {  
 String s = String.*valueOf*(x);  
 StringBuffer sb = new StringBuffer(s);  
 String s1 = String.*valueOf*(sb.reverse());  
  
 if (s.equals(s1)) {  
 return true;  
 } else {  
 return false;  
 }  
 }  
}  
  
// <https://leetcode.com/problems/palindrome-number/>

**Another Solution: 01**

public class Solution {  
 public boolean isPalindrome(int x) {  
 if (x < 0) return false;  
 int y = x;  
 int res = 0;  
 while (y != 0) {  
 res = res \* 10 + y % 10;  
 y /= 10;  
 }  
 return x == res;  
 }  
}

**Another Solution: 02**

public boolean isPalindrome(int x){  
 int p=x,q=0;  
 while(p>=1){  
 q\*=10;  
 q+=p%10;  
 p/=10;  
 }  
 return q==x;  
 }

**Another Solution: 03**

**01. Problem: 2235. Add Two Integers**

**Given two integers num1 and num2, return the sum of the two integers.**

**Example 1:**

**Input:** num1 = 12, num2 = 5

**Output:** 17

**Explanation:** num1 is 12, num2 is 5, and their sum is 12 + 5 = 17, so 17 is returned.

**Example 2:**

**Input:** num1 = -10, num2 = 4

**Output:** -6

**Explanation:** num1 + num2 = -6, so -6 is returned.

**Constraints:**

-100 <= num1, num2 <= 100

**Solution:**

**My Solution:**

public class O1\_AddTwoIntegers\_2235 {  
 public static void main(String[] args) {  
 Solution s = new Solution();  
 System.*out*.println(s.sum(5, 8));  
 }  
}  
  
class Solution {  
 public int sum(int num1, int num2) {  
 return num1 + num2;  
 }  
}  
  
// <https://leetcode.com/problems/add-two-integers/>

**Another Solution: 01**

class Solution {  
 public int sum(int num1, int num2) {  
 if (num2 == 0) return num1;  
 int temp = (num1 & num2) << 1;  
 return sum(num1 ^ num2, temp);  
 }  
}

**Another Solution: 02**

**Another Solution: 03**

**Day 00-1929, , , , , .**

**5. Problem:**

**Solution:**

**My Solution:**

**Another Solution: 01**

**Another Solution: 02**

**Another Solution: 03**

**04. Problem:**

**Solution:**

**My Solution:**

**Another Solution: 01**

**Another Solution: 02**

**Another Solution: 03**

**03. Problem:**

**Solution:**

**My Solution:**

**Another Solution: 01**

**Another Solution: 02**

**Another Solution: 03**

**02. Problem:**

**Solution:**

**My Solution:**

**Another Solution: 01**

**Another Solution: 02**

**Another Solution: 03**

**01. Problem:**

**Solution:**

**My Solution:**

**Another Solution: 01**

**Another Solution: 02**

**Another Solution: 03**

A a = new A(); a.run(); // A  
A a2 = new B(); a2.run(); // B  
B a3 = new B(); a3.run(); // B  
  
//B a4 = new A(); a3.run(); // Not Allow, compile time error  
B a5 = (B) new A(); a3.run(); // Not Allow, run time error, cannot cast