

# 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 1<sup>st</sup> column is denoted by 'A', the 2<sup>nd</sup> by 'B', the 3<sup>rd</sup> by 'C', and so on.

<row> is the row number  $r$  of the cell. The  $r^{\text{th}}$  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  $r1 \leq r2$  and  $c1 \leq c2$ .

Return the list of cells  $(x, y)$  such that  $r1 \leq x \leq r2$  and  $c1 \leq y \leq c2$ . 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:

	K	L
1		
2		

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:

	A	B	C	D	E	F
1						

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'  $\leq s[0] \leq s[3] \leq 'Z'$

'1'  $\leq s[1] \leq s[4] \leq '9'$

$s$  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:

t	h	e	q	u	i	c	k	b	r	o	w	n	f	x	j	m	p	s	v	l	a	z	y	d	g
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z

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:

e	l	j	u	x	h	p	w	n	y	r	d	g	t	q	k	v	i	s	z	c	f	m	a	b	o
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z

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 converging 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:

$2 \leq n \leq 10^4$

`encoded.length == n - 1`

$0 \leq \text{encoded}[i] \leq 10^5$

$0 \leq \text{first} \leq 10^5$

# 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;
    }
}
/* Explanation:
 * 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) {
        // initialize 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  $i^{\text{th}}$  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:

$1 \leq \text{digits.length} \leq 100$

$0 \leq \text{digits}[i] \leq 9$

`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;
            }
        }
        digits[i] = 0;

        // 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

        // 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 ] then 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:

$1 \leq \text{nums.length} \leq 3 \times 10^4$   
 $-3 \times 10^4 \leq \text{nums}[i] \leq 3 \times 10^4$

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 corresponding 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 :  $O(n \log n)$ , 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
    }
}

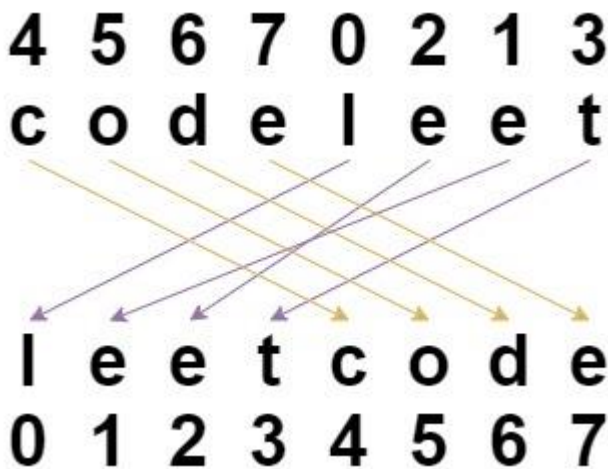
```

## 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 *i*<sup>th</sup> 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;
            }
            i++;
        }
        return new String(chArray);
    }
}
```

```

        // 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:

$3 \leq \text{nums.length} \leq 200$

$0 \leq \text{nums}[i] \leq 200$

$1 \leq \text{diff} \leq 50$

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  $i \bmod 10 == \text{nums}[i]$ , or  $-1$  if such index does not exist.*

$x \bmod y$  denotes the remainder when  $x$  is divided by  $y$ .

Example 1:

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

Output: `0`

Explanation:

$i=0$ :  $0 \bmod 10 = 0 == \text{nums}[0]$ .

$i=1$ :  $1 \bmod 10 = 1 == \text{nums}[1]$ .

$i=2$ :  $2 \bmod 10 = 2 == \text{nums}[2]$ .

All indices have  $i \bmod 10 == \text{nums}[i]$ , so we return the smallest index `0`.

Example 2:

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

Output: `2`

Explanation:

$i=0$ :  $0 \bmod 10 = 0 != \text{nums}[0]$ .

$i=1$ :  $1 \bmod 10 = 1 != \text{nums}[1]$ .

$i=2$ :  $2 \bmod 10 = 2 == \text{nums}[2]$ .

$i=3$ :  $3 \bmod 10 = 3 != \text{nums}[3]$ .

`2` is the only index which has  $i \bmod 10 == \text{nums}[i]$ .

Example 3:

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

Output: `-1`

Explanation: No index satisfies  $i \bmod 10 == \text{nums}[i]$ .

Constraints:

$1 \leq \text{nums.length} \leq 100$

$0 \leq \text{nums}[i] \leq 9$

## 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  $i \bmod 10 == \text{nums}[i]$ , or  $-1$  if such index does not exist.*

$x \bmod y$  denotes the **remainder** when  $x$  is divided by  $y$ .

#### Example 1:

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

**Output:** `0`

**Explanation:**

$i=0$ :  $0 \bmod 10 = 0 == \text{nums}[0]$ .

$i=1$ :  $1 \bmod 10 = 1 == \text{nums}[1]$ .

$i=2$ :  $2 \bmod 10 = 2 == \text{nums}[2]$ .

All indices have  $i \bmod 10 == \text{nums}[i]$ , so we return the smallest index `0`.

#### Example 2:

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

**Output:** `2`

**Explanation:**

$i=0$ :  $0 \bmod 10 = 0 \neq \text{nums}[0]$ .

$i=1$ :  $1 \bmod 10 = 1 \neq \text{nums}[1]$ .

$i=2$ :  $2 \bmod 10 = 2 == \text{nums}[2]$ .

$i=3$ :  $3 \bmod 10 = 3 \neq \text{nums}[3]$ .

`2` is the only index which has  $i \bmod 10 == \text{nums}[i]$ .

#### Example 3:

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

**Output:** `-1`

**Explanation:** No index satisfies  $i \bmod 10 == \text{nums}[i]$ .

#### Constraints:

$1 \leq \text{nums.length} \leq 100$

$0 \leq \text{nums}[i] \leq 9$

# 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:

$3 \leq nums.length \leq 200$

$0 \leq nums[i] \leq 200$

$1 \leq diff \leq 50$

`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)
                }
            }
        }
        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  $i^{\text{th}}$  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  $i^{\text{th}}$  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;
    }
}
```

### 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  $m \times n$  integer grid `accounts` where `accounts[i][j]` is the amount of money the  $i^{\text{th}}$  customer has in the  $j^{\text{th}}$  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  $[x_1, x_2, \dots, x_n, y_1, y_2, \dots, y_n]$ .  
Return the array in the form  $[x_1, y_1, x_2, y_2, \dots, x_n, y_n]$ .

### Example 1:

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

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

Explanation: Since  $x_1=2$ ,  $x_2=5$ ,  $x_3=1$ ,  $y_1=3$ ,  $y_2=4$ ,  $y_3=7$  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:

$1 \leq \text{num1.length}, \text{num2.length} \leq 10^4$

`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 efficiency 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** 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** 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:

$1 \leq \text{nums.length} \leq 3 \times 10^4$

$-100 \leq \text{nums}[i] \leq 100$

`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 == 0 check 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;
    }
}
```

## 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:

$2 \leq \text{nums.length} \leq 10^4$

$-10^9 \leq \text{nums}[i] \leq 10^9$

$-10^9 \leq \text{target} \leq 10^9$

Only one valid answer exists.

Follow-up: Can you come up with an algorithm that is less than  $O(n^2)$  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_1816.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 approach 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:

$1 \leq \text{operations.length} \leq 100$

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  $0 \leq i < n$  (**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

## 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:**

$-2^{31} \leq x \leq 2^{31} - 1$

**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

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## 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**

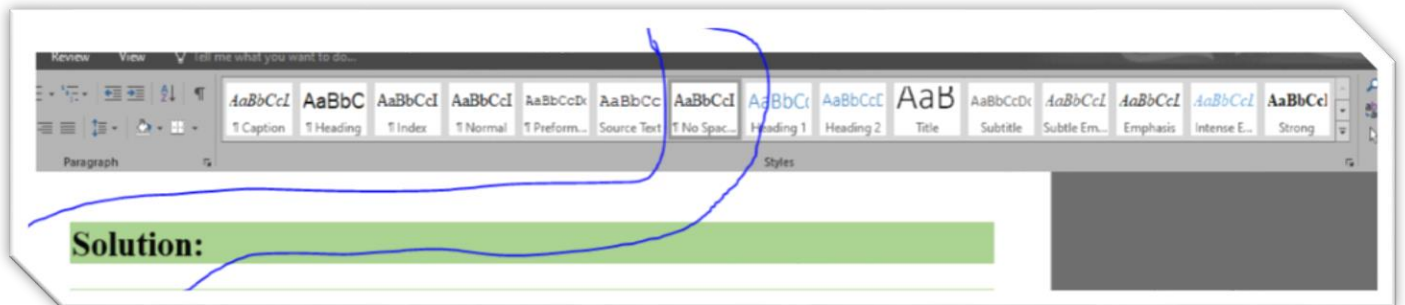
**Another Solution: 02**

## Another Solution: 03



The screenshot shows the Microsoft Word ribbon with the 'Review' tab selected. The 'Styles' group is visible, and the 'No Spacing' style is circled in blue. Below the ribbon, the text '06. Problem: 1929. Concatenation of Array' is displayed on an orange background.

06. Problem: 1929. Concatenation of Array



The screenshot shows the Microsoft Word ribbon with the 'Review' tab selected. The 'No Spacing' style is circled in blue. Below the ribbon, a green box contains the text 'Solution:'. A blue line connects the 'No Spacing' style to the 'Solution:' box.

Solution: