CS23333-Object Oriented Programming Using Java-2023

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Question **1**

Correct

Marked out of 5.00

Flag question

You are provided with a string which has a sequence of 1's and 0's.

This sequence is the encoded version of a English word. You are supposed write a program to decode the provided string and find the original word.

Each alphabet is represented by a sequence of 0s.

This is as mentioned below:

Z : 0

Y : 00

X : 000

W : 0000

V : 00000

U : 000000

T : 0000000

and so on upto A having 26 0's (00000000000000000000000000).

The sequence of 0's in the encoded form are separated by a single 1 which helps to distinguish between 2 letters.

Example 1:

input1: 010010001

The decoded string (original word) will be: ZYX

Example 2:

input1: 00001000000000000000000010000000000010000000001000000000001

The decoded string (original word) will be: WIPRO

Note: The decoded string must always be in UPPER case.

For example:

Input	Result
010010001	ZYX
00001000000000000000000010000000000010000000001000000000001	WIPRO

Answer: (penalty regime: 0 %)

```
import java.util.Scanner;

public class Decoder {

    public static String decode(String encodedString) {
        String[] segments = encodedString.split("1");
        StringBuilder decodedWord = new StringBuilder();
        for (String segment : segments) {
            if (segment.length() > 0) {
                int letterPosition = segment.length();
                if (letterPosition >= 1 && letterPosition <= 26) {
                    char letter = (char) ('Z' - (letterPosition - 1));
                    decodedWord.append(letter);
                }
            }
        }
        return decodedWord.toString();
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String encodedString = scanner.nextLine();
        String decodedWord = decode(encodedString);
        System.out.println(decodedWord);
    }
}
```

	Input	Expected	Got	
✓	010010001	ZYX	ZYX	✓
✓	00001000000000000000000010000000000010000000001000000000001	WIPRO	WIPRO	✓

Passed all tests! ✓

Question **2**

Correct

Marked out of 5.00

Flag question

Given two char arrays input1[] and input2[] containing only lower case alphabets, extracts the alphabets which are present in both arrays (common alphabets).

Get the ASCII values of all the extracted alphabets.

Calculate sum of these ASCII values. Lets call it sum1 and calculate single digit sum of sum1 i.e. keep adding the digits of sum1 until you arrive

Flag question

Calculate sum of those ASCII values. Lets call it sum1 and calculate single digit sum of sum1, i.e., keep adding the digits of sum1 until you arrive at a single digit.

Return that single digit as output.

Note:

1. Array size ranges from 1 to 10.
2. All the array elements are lower case alphabets.
3. Atleast one common alphabet will be found in the arrays.

Example 1:

input1: {'a', 'b', 'c'}

input2: {'b', 'c'}

output: 8

Explanation:

'b' and 'c' are present in both the arrays.

ASCII value of 'b' is 98 and 'c' is 99.

98 + 99 = 197

1 + 9 + 7 = 17

1 + 7 = 8

For example:

Input	Result
a b c b c	8

Answer: (penalty regime: 0 %)

```
import java.util.HashSet;
import java.util.Set;

public class CommonCharSum {
        public static int calculateSingleDigitSum(char[] input1, char[] input2) {
        Set<Character> set1 = new HashSet<>();
        Set<Character> set2 = new HashSet<>();
                for (char ch : input1) {
            set1.add(ch);
        }
                for (char ch : input2) {
            set2.add(ch);
        }
                set1.retainAll(set2);
                int sum1 = 0;
        for (char ch : set1) {
            sum1 += (int) ch;
        }

        return getSingleDigitSum(sum1);
    }

    public static int getSingleDigitSum(int sum) {
        while (sum >= 10) {
            int tempSum = 0;
            while (sum > 0) {
                tempSum += sum % 10;
                sum /= 10;
            }
            sum = tempSum;
        }
        return sum;
    }

    public static void main(String[] args){
        char[] input1 = {'a', 'b', 'c'};
        char[] input2 = {'b', 'c'};

        int result = calculateSingleDigitSum(input1, input2);
        System.out.println(result);
    }
}
```

	Input	Expected	Got	
✓	a b c b c	8	8	✓

Passed all tests! ✓

Question **3**

Correct

Marked out of 5.00

Flag question

Write a function that takes an input String (sentence) and generates a new String (modified sentence) by reversing the words in the original String, maintaining the words position.

In addition, the function should be able to control the reversing of the case (upper or lowercase) based on a case_option parameter, as follows:

If case_option = 0, normal reversal of words i.e., if the original sentence is "Wipro TechNologies BangaLore", the new reversed sentence should be "orpiW seigoloNhceT eroLagnaB".

If case_option = 1, reversal of words with retaining position's case i.e., if the original sentence is "Wipro TechNologies BangaLore", the new reversed sentence should be "Orpiw SeigOlonhcet ErolaGnab".

Note that positions 1, 7, 11, 20 and 25 in the original string are uppercase W, T, N, B and L.

Similarly, positions 1, 7, 11, 20 and 25 in the new string are uppercase O, S, O, E and G.

NOTE

NOTE:

1. Only space character should be treated as the word separator i.e., "Hello World" should be treated as two separate words, "Hello" and "World". However, "Hello,World", "Hello;World", "Hello-World" or "Hello/World" should be considered as a single word.

2. Non-alphabetic characters in the String should not be subjected to case changes. For example, if case option = 1 and the original sentence is "Wipro TechNologies, Bangalore" the new reversed sentence should be "Orpiw ,seiGolonhceT Erolagnab". Note that comma has been treated as part of the word "Technologies," and when comma had to take the position of uppercase T it remained as a comma and uppercase T took the position of comma. However, the words "Wipro and Bangalore" have changed to "Orpiw" and "Erolagnab".

3. Kindly ensure that no extra (additional) space characters are embedded within the resultant reversed String.

Examples:

S. No.	input1	input2	output
1	Wipro Technologies Bangalore	0	orpiW seigolonhceT erolagnaB
2	Wipro Technologies, Bangalore	0	orpiW ,seigolonhceT erolagnaB
3	Wipro Technologies Bangalore	1	Orpiw Seigolonhcet Erolagnab
4	Wipro Technologies, Bangalore	1	Orpiw ,seigolonhceT Erolagnab

For example:

Input	Result
Wipro Technologies Bangalore 0	orpiW seigolonhceT erolagnaB
Wipro Technologies, Bangalore 0	orpiW ,seigolonhceT erolagnaB
Wipro Technologies Bangalore 1	Orpiw Seigolonhcet Erolagnab
Wipro Technologies, Bangalore 1	Orpiw ,seigolonhceT Erolagnab

Answer: (penalty regime: 0 %)

```java
import java.util.Scanner;

public class ReverseWordsWithCaseControl {
    public static String reverseWordsWithCase(String sentence, int case_option) {
        String[] words = sentence.split(" ");
        StringBuilder result = new StringBuilder();

        for (String word : words) {
            String reversedWord = reverseWord(word);
            if (case_option == 1) {
                reversedWord = reverseCaseWithOriginalPosition(reversedWord, word);
            }
           result.append(reversedWord).append(" ");
        }return result.toString().trim();
    }

    private static String reverseWord(String word) {
        StringBuilder reversed = new StringBuilder(word);
        return reversed.reverse().toString();
    }

    private static String reverseCaseWithOriginalPosition(String reversedWord, String originalWord) {
        StringBuilder result = new StringBuilder(reversedWord);
            for (int i = 0; i < originalWord.length(); i++) {
            char originalChar = originalWord.charAt(i);
            char reversedChar = reversedWord.charAt(i);
            if (Character.isUpperCase(originalChar)) {
                result.setCharAt(i, Character.toUpperCase(reversedChar));
            } else if (Character.isLowerCase(originalChar)) {
                result.setCharAt(i, Character.toLowerCase(reversedChar));
            }
        }
return result.toString();
    }

    public static void printResult(String input, int case_option) {
        String result = reverseWordsWithCase(input, case_option);
        System.out.println(result);
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String input = scanner.nextLine();
        int case_option = scanner.nextInt();
        printResult(input, case_option);
        scanner.close();
    }
}
```

	Input	Expected	Got	
✓	Wipro Technologies Bangalore 0	orpiW seigolonhceT erolagnaB	orpiW seigolonhceT erolagnaB	✓
✓	Wipro Technologies, Bangalore 0	orpiW ,seigolonhceT erolagnaB	orpiW ,seigolonhceT erolagnaB	✓
✓	Wipro Technologies Bangalore 1	Orpiw Seigolonhcet Erolagnab	Orpiw Seigolonhcet Erolagnab	✓
✓	Wipro Technologies, Bangalore 1	Orpiw ,seigolonhceT Erolagnab	Orpiw ,seigolonhceT Erolagnab	✓

Passed all tests! ✓

Finish review