

WEEK-12

ROLL NO:230701236

1) 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

(00000000000000000000000000000000).

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: 000010000000000000000000100000000000100000000010000000000001
```

The decoded string (original word) will be: WIPRO

For example:

Input	Result
010010001	ZYX
000010000000000000000000100000000000100000000010000000000001	WIPRO

CODE:

```
import java.util.Scanner;

public class DecodeBinaryString {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String input = scanner.nextLine();
        String decodedString = decodeString(input);
        System.out.println( decodedString);    scanner.close();
    }
    private static String decodeString(String input) {
        String[] zeroSequences = input.split("1");
        StringBuilder decodedWord = new StringBuilder();
        for (String zeroSequence : zeroSequences) {        int
        length = zeroSequence.length();        if (length > 0) {
        char letter = (char) ('Z' - (length - 1));
        decodedWord.append(letter);
            }
        }
        return decodedWord.toString();
    }
}
```

OUTPUT:

	Input	Expected	Got	
✓	010010001	ZYX	ZYX	✓
✓	0000100000000000000000001000000000001000000000010000000000001	WIPRO	WIPRO	✓

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

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.

For example:

Code:

```

    }
    return sum;
}

public static int commonAlphabetsSingleDigitSum(char[] input1, char[] input2) {
    Set<Character> set1 = new HashSet<>();
    Set<Character> set2 = new HashSet<>();
    for (char c : input1) {        set1.add(c);
        }
        for (char c : input2) {
set2.add(c);
        }
        set1.retainAll(set2);
int asciiSum = 0;        for
(char c : set1) {
asciiSum += (int) c;
        }
        return getSingleDigitSum(asciiSum);
    }

    public static void main(String[] args) {        char[] input1 = {'a',
'b', 'c'};        char[] input2 = {'b', 'c'};        int result =
commonAlphabetsSingleDigitSum(input1, input2);
System.out.println(result);

    }
}

```

Output:

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

Passed all tests! ✓

3) 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.

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

CODE:

```
import java.util.Scanner; public class
SentenceReverser {   public static void
main(String[] args) {
    Scanner scanner = new Scanner(System.in);
String sentence = scanner.nextLine();    int
caseOption = scanner.nextInt();
    String result = reverseWords(sentence, caseOption);
System.out.println( result);    scanner.close();
}
/**
 * This function takes a sentence and reverses each word as per the case_option.
 *
 * @param sentence   The original sentence to process.
 * @param caseOption The option to handle case sensitivity (0 for normal, 1 for
casesensitive).
 * @return          The modified sentence with reversed words.
 */
    public static String reverseWords(String sentence, int caseOption) {
        String[] words = sentence.split(" ");
StringBuilder result = new StringBuilder();    for
(int w = 0; w < words.length; w++) {
    String word = words[w];
    StringBuilder reversedWord = new StringBuilder(word.length());
for (int i = 0; i < word.length(); i++) {        char originalChar =
word.charAt(i);        char reversedChar =
word.charAt(word.length() - 1 - i);        if (caseOption == 1 &&
Character.isLetter(originalChar)) {            if
```

```

(Character.isUpperCase(originalChar)) {                reversedChar =
Character.toUpperCase(reversedChar);

    } else {
        reversedChar = Character.toLowerCase(reversedChar);
    }
}

reversedWord.append(reversedChar);
}        if (w > 0) {
result.append(" ");
}

result.append(reversedWord);
}

return result.toString();
}
}

```

OUTPUT:

	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! ✓