

Rajalakshmi Engineering College

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Branch: REC

Department: AI & DS - Section 3

Batch: 2028

Degree: B.E - AI & DS

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 4_PAH

Attempt : 1

Total Mark : 40

Marks Obtained : 37.5

Section 1 : Coding

1. Problem Statement

Riya is preparing a puzzle game for her friends. She wants to include a feature that highlights special words in a sentence – specifically, palindromic words (words that read the same forward and backward).

Your task is to help Riya by writing a program that extracts all palindrome words from the given sentence. If there are no palindromes, print "No palindromes found".

Input Format

The input contains a single string S representing a sentence.

Output Format

The output prints all palindromic words separated by a space.

If no palindrome exists, print "No palindromes found".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: madam went to school

Output: madam

Answer

```
// You are using Java
import java.util.*;

public class Main {
    public static boolean isPalindrome(String word) {
        int left = 0, right = word.length() - 1;
        while (left < right) {
            if (word.charAt(left) != word.charAt(right)) {
                return false;
            }
            left++;
            right--;
        }
        return true;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String line = sc.nextLine();
        String[] words = line.split("\\s+");
        boolean found = false;
        for (String word : words) {
            if (isPalindrome(word)) {
                System.out.println(word);
                found = true;
            }
        }
        if (!found) {
```

```
        System.out.println("No palindromes found");
    }
}
}
```

Status : Correct

Marks : 10/10

2. Problem Statement

At a digital library, the system needs to analyze passages to identify the frequency of vowels, since they are key for linguistic research. You are asked to write a program that counts the number of vowels in each passage of text.

The vowels of interest are:

a, e, i, o, u (both uppercase and lowercase).

Input Format

The first line of input contains an integer T, representing the number of test cases (passages).

Each of the next T lines contains a single passage of text.

Output Format

For each test case, print a single integer representing the total number of vowels in the passage.

The first line of output corresponds to the first passage, the second line to the second passage, and so on.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
Hello World
Output: 3

Answer

```
// You are using Java
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int T = sc.nextInt();
        sc.nextLine(); // Consume the leftover newline

        String vowels = "aeiouAEIOU";

        for (int t = 0; t < T; t++) {
            String passage = sc.nextLine();
            int count = 0;

            for (int i = 0; i < passage.length(); i++) {
                char ch = passage.charAt(i);
                if (vowels.indexOf(ch) != -1) {
                    count++;
                }
            }

            System.out.println(count);
        }
        sc.close();
    }
}
```

Status : Correct

Marks : 10/10

3. Problem Statement

Ravi is analyzing text messages for his research on typing patterns. He wants to count the number of uppercase letters, lowercase letters, and digits in a sentence to understand typing trends.

Your task is to help Ravi by writing a program that takes a sentence and

prints the count of uppercase letters, lowercase letters, and digits.

Input Format

The input contains a single line containing a sentence (string).

Output Format

The output prints three integers separated by spaces:

- Number of uppercase letters
- Number of lowercase letters
- Number of digits

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Hello World 123

Output: 2 8 3

Answer

```
// You are using Java
import java.util.*;

public class Main{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String sentence = sc.nextLine(); // Read the full sentence

        int upperCount = 0, lowerCount = 0, digitCount = 0;

        for (int i = 0; i < sentence.length(); i++) {
            char ch = sentence.charAt(i);
            if (Character.isUpperCase(ch)) {
                upperCount++;
            } else if (Character.isLowerCase(ch)) {
                lowerCount++;
            } else if (Character.isDigit(ch)) {
                digitCount++;
            }
        }
    }
}
```

```
        }  
        System.out.println(upperCount + " " + lowerCount + " " + digitCount);  
        sc.close();  
    }  
}
```

Status : Correct

Marks : 10/10

4. Problem Statement

Sana is analyzing text for a secret code. She wants to find all words in a sentence that start and end with the same letter. These words are considered "special words" for her analysis.

Your task is to write a program that extracts and prints all words that start and end with the same letter (case-insensitive).

If no such word exists, print "No special words found".

Input Format

The input contains a single line containing a sentence with multiple words.

Output Format

The output prints all words that start and end with the same letter separated by a space.

If no word satisfies the condition, print "No special words found".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Anna went to the civic center

Output: Anna civic

Answer

```
// You are using Java
import java.util.*;

public class Main{
    // Function to check if a word is palindrome (case-insensitive)
    public static boolean isPalindrome(String word) {
        word = word.toLowerCase(); // Ignore case
        int left = 0, right = word.length() - 1;
        while (left < right) {
            if (word.charAt(left) != word.charAt(right)) {
                return false;
            }
            left++;
            right--;
        }
        return true;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String line = sc.nextLine(); // Read full sentence
        String[] words = line.split("\\s+"); // Split into words

        List<String> palindromes = new ArrayList<>();

        for (String word : words) {
            if (isPalindrome(word)) {
                palindromes.add(word);
            }
        }

        if (palindromes.isEmpty()) {
            System.out.println("No special words found");
        } else {
            for (String word : palindromes) {
                System.out.print(word + " ");
            }
        }

        sc.close();
    }
}
```

Status : Partially correct

Marks : 7.5/10