R. CONCEICAO RODRIGUES COLLEGE OF ENGINEERIG
Department of Computer Engineering

Experiment 8- Based on Exception Handling

1. Course Details:

Academic Year	**2023 - 24**	**Estimated Time**	**Experiment No. 8– 02 Hours**
Course & Semester	**S.E. (COMP) – Sem. III**	**Subject Name**	**Skill based lab Course-OOP with Java**
Module No.	**05**	**Chapter Title**	**Exception Handling and multithreading**
Experiment Type	**Software Performance**	**Subject Code**	**CSL304**

Name of Student	Mark Lopes	**Roll No.**	9913
Date of Performance:	04/10/23	**Date of Submission:**	13/10/23
CO Mapping	**CSL304.4 Implement the concept of inheritance, exception handling and multithreading**		

Timeline (2)	Preparedness (2)	Effort (3)	Result (3)	Total (10)

Problem statement:

1) Write a Java program to create a method that takes a string as input and throws an exception if the string does not contain vowels.

CODE:

```
import java.util.Scanner;

public class Vowel_Check {
  public static void main(String[] args) {
    Scanner scan = new Scanner(System.in);
    System.out.print("Enter the string:\t");
    try {
      String text = scan.nextLine();
```

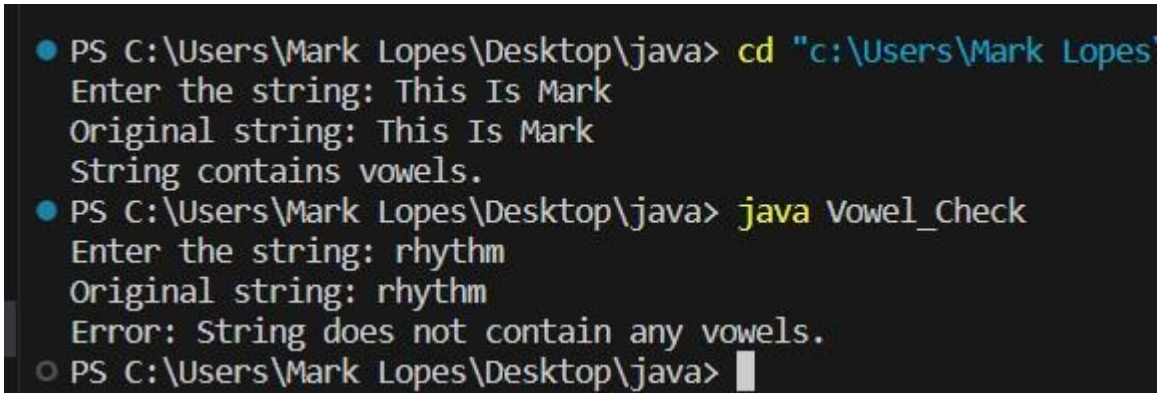
```
      System.out.println("Original string: " + text);
      checkVowels(text);
      // the next line will execute only if there are vowels
      System.out.println("String contains vowels.");
    } catch (NoVowelsException e) {
      // print error
      System.out.println("Error: " + e.getMessage());
    }
  }

  public static void checkVowels(String text) throws
NoVowelsException {
    boolean containsVowels = false;
    String vowels = "aeiouAEIOU";

    // disintegrate the string and check if any character of the
string is a vowel
    for (int i = 0; i < text.length(); i++) {
      char ch = text.charAt(i);
      if (vowels.contains(String.valueOf(ch))) {
        containsVowels = true;
        break;
      }
    }
    // if no vowels then throw error
    if (!containsVowels) {
      throw new NoVowelsException("String does not contain any
vowels.");
    }
  }
}

// custom exception class
class NoVowelsException extends Exception {
  public NoVowelsException(String message) {
    super(message);
  }
}
```

OUTPUT:


PS C:\Users\Mark Lopes\Desktop\java> cd "c:\Users\Mark Lopes
Enter the string: This Is Mark
Original string: This Is Mark
String contains vowels.
PS C:\Users\Mark Lopes\Desktop\java> java Vowel_Check
Enter the string: rhythm
Original string: rhythm
Error: String does not contain any vowels.
PS C:\Users\Mark Lopes\Desktop\java>

2) For a given String (say "56a31"), extract individual character and print in word format, for example for above given input, print Five, Six, and so on & wherever a non-digit character is encountered throw an Exception.

CODE:

```
import java.util.HashMap;
import java.util.Scanner;

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

      System.out.print("Enter the number:\t");
      String input = scan.nextLine();

      extractWords(input);
      System.out.println("\nThe string only consists of
numbers");
    } catch (NonDigitCharacterException e) {
      System.out.println(e.getMessage());
    }
  }

  public static void extractWords(String input) throws
NonDigitCharacterException {
    // Define a HashMap of words for each digit.Works kinda
like a 1:1 2D array but
    // with mostly O(1) fetching time.
    HashMap<Character, String> words = new HashMap<>();
    words.put('0', "Zero");
    words.put('1', "One");
    words.put('2', "Two");
    words.put('3', "Three");
    words.put('4', "Four");
    words.put('5', "Five");
    words.put('6', "Six");
    words.put('7', "Seven");
```

```
    words.put('8', "Eight");
    words.put('9', "Nine");

    // Iterate over each character in the input string
    for (char c : input.toCharArray()) {
      // Check if the character is a digit
      if (Character.isDigit(c)) {
        // Convert the digit to its word format
        String word = words.get(c);
        // Print the word format of the digit
        System.out.print(word + " ");
      } else {
        // Throw a custom exception if the character is not
a digit
        throw  new  NonDigitCharacterException("\nInvalid
input: non-digit character encountered");
      }
    }
  }
}

class NonDigitCharacterException extends Exception {
  public NonDigitCharacterException(String message) {
    super(message);
  }
}
```

OUTPUT:

```
PROBLEMS 6   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

PS C:\Users\Mark Lopes\Desktop\java> cd "c:\Users\Mark Lopes
Enter the number: 157898
One Five Seven Eight Nine Eight
The string only consists of numbers
PS C:\Users\Mark Lopes\Desktop\java> java Main
Enter the number: 234e56
Two Three Four
Invalid input: non-digit character encountered
PS C:\Users\Mark Lopes\Desktop\java>
```

3) Write a java program that reads basic salary of an employee and finds the gross salary. Create a user defined Exception class known as “PayOutOfBoundsException”. The organisation does not offer a basic salary of less than 8000. If entered salary is less than 8000 the program should create an Exception of type PayOutOfBoundsException,
The program should calculate gross salary by considering salary parameters such as Dearness Allowance (DA), HRA, Travelling Allowance (TA), Professional Tax (PT), TDS. (Gross salary =basic_salary+DA+HRA+TA-PT-TDS). All inputs are taken from the user.
CODE:

```
import java.util.Scanner;

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

    // Read the basic salary from the user
    System.out.print("Enter the basic salary: ");
    int basicSalary = sc.nextInt();
    try {
      // Calculate the gross salary
      int grossSalary = calculateGrossSalary(basicSalary);
      System.out.println("Gross salary: " + grossSalary);
    } catch (PayOutOfBoundsException e) {
      System.out.println(e.getMessage());
    }
  }

  public static int calculateGrossSalary(int basicSalary)
throws PayOutOfBoundsException {
    // Check if the basic salary is less than 8000
    if (basicSalary < 8000) {
      // Throw a custom exception if the basic salary is
less than 8000
      throw   new   PayOutOfBoundsException("Basic   salary
cannot be less than 8000");
    }
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the Dearness Allowance : ");
    int da = sc.nextInt();
```

```
    System.out.print("Enter the House Rent Allowance: ");
    int hra = sc.nextInt();
    System.out.print("Enter the Travelling Allowance : ");
    int ta = sc.nextInt();
    System.out.print("Enter the Professional Tax : ");
    int pt = sc.nextInt();
    System.out.print("Enter  the  TDS(Tax  Deducted  at
source): ");
    int tds = sc.nextInt();
    // Calculate the gross salary using the given formula
    int grossSalary = basicSalary + da + hra + ta - pt -
tds;

    return grossSalary;
  }
}

class PayOutOfBoundsException extends Exception {
  public PayOutOfBoundsException(String message) {
    super(message);
  }
}
```

OUTPUT:

```
PS C:\Users\Mark Lopes\Desktop\java> javac Main1.java
PS C:\Users\Mark Lopes\Desktop\java> java Main1
Enter the basic salary: 7000
Basic salary cannot be less than 8000
PS C:\Users\Mark Lopes\Desktop\java> java Main1
Enter the basic salary: 8500
Enter the Dearness Allowance : 500
Enter the House Rent Allowance: 1000
Enter the Travelling Allowance : 500
Enter the Professional Tax : 200
Enter the TDS(Tax Deducted at source): 150
Gross salary: 10150
PS C:\Users\Mark Lopes\Desktop\java>
```