**Program 1:**

Develop a simple java application to calculate the tax for a particular employee based on his salary. Develop a class named “TaxCalculator“ with a method named calculateTax with the following method parameters, Variable Name Data Type empName String isIndian boolean empSal double This method should return a double taxAmount. The business logic for calculating the tax is as follows, this has to be implemented inside the method, If the employee is not a Indian The calculator should throw a CountryNotValidException If the employee name is null or empty The calculator should throw a EmployeeNameInvalidException If empSal is greater than one lakh and isIndian true taxAmount =empSal \*8/100 Otherwise If empSal is between 50K and 1lakh and isIndian true taxAmount =empSal \*6/100 Otherwise If empSal is between 30 and 50 Thousand and isIndian true taxAmount =empSal \*5/100 Otherwise If empSal is between 10 and 30 Thousand and isIndian true taxAmount =empSal \*4/100 Otherwise The calculator should throw a TaxNotEligibleException. Develop a main class CalculatorSimulator , implement the following logic in main method 1. Execute the calculateTax Method and print the tax amount as “Tax amount is “ 2. In case the calculateTaxMethod throws exceptions, this method needs to catch the appropriate exception print the stack trace and display the following messages, a. Country not valid: “The employee should be an Indian citizen for calculating tax” b. Employee name not valid: “The employee name cannot be empty” c. Not eligible for Tax calculation: “The employee does not need to pay tax” The following test cases to be executed, change the data in main method and run it and verify the output messages Test Cases Employee Name Employee Salary Is Indian Message Expected Test Case 1 Ron 34000 False The employee should be an Indian citizen for calculating tax. Test Case 2 Tim 1000 True The employee does not need to pay tax Test Case 3 Jack 55000 True Tax amount is 3300 Test Case 4 30000 True The employee name cannot be empty.

**Code:**

// Defined the CountryNotValidException here

class CountryNotValidException extends Exception{

    // Its constructor

    public CountryNotValidException(String message){

        super(message);

    }

}

// Defined EmployeeNameInvalidException

class EmployeeNameInvalidException extends Exception{

    // Its constructor

    public EmployeeNameInvalidException(String message){

        super(message);

    }

}

// Defined TaxNotEligibleException

class TaxNotEligibleException extends Exception{

    // Its constructor

    public TaxNotEligibleException(String message){

        super(message);

    }

}

// TaxCalculator class

public class TaxCalculator{

    String empName;

    boolean isIndian;

    double empSal;

    double taxAmount;

    // method for calculating the tax

    public void calculateTax(String empName, double empSal, boolean isIndian) throws CountryNotValidException, EmployeeNameInvalidException, TaxNotEligibleException{

        // If employee is not indian, then throw CountryNotValidException

        if(!isIndian){

            throw new CountryNotValidException("The employee should be an Indian citizen for calculating tax");

        }

        // If employee name is null or empty, then throw EmployeeNameInvalidException

        else if(empName == null){

            throw new EmployeeNameInvalidException("The employee name cannot be empty");

        }

        // If employee salary is greater than 100000 and is indian, then tax is 8%

        else if(empSal > 100000 && isIndian){

            taxAmount = empSal \* 8/100;

            System.out.println("Tax amount is : "+taxAmount);

        }

        // If employee salary is between 50k and 1 lakh and is indian, then tax is 6%

        else if(empSal > 50000 && empSal <= 100000 && isIndian){

            taxAmount = empSal \* 6/100;

            System.out.println("Tax amount is : "+taxAmount);

        }

        // If employee salary is between 30k and 50k and is indian, then tax is 5%

        else if(empSal > 30000 && empSal <=50000 && isIndian){

            taxAmount = empSal \* 5/100;

            System.out.println("Tax amount is : "+taxAmount);

        }

        // If employee salary is between 10k and 30k and is indian, then tax is 4%

        else if(empSal > 10000 && empSal <= 30000 && isIndian){

            taxAmount = empSal \* 4/100;

            System.out.println("Tax amount is : "+taxAmount);

        }

        // Otherwises throwing TaxNotEligibleException

        else{

            throw new TaxNotEligibleException("The employee does not need to pay tax");

        }

    }

    public static void main(String [] args) throws CountryNotValidException, EmployeeNameInvalidException, TaxNotEligibleException{

        // Making an object of TaxCalculator class

        TaxCalculator tax = new TaxCalculator();

        // Using try-catch to handle exceptions

        try{

            tax.calculateTax("Tim",1000, true);

        }

        catch(Exception e){

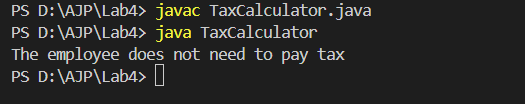
            System.out.println(e.getMessage());

        }

    }

}

**Output:**

****

**Program 2:**

Create a program with a logic that throws the ArrayIndexOutOfBoundsException while accessing elements in an array.[Hint: Use array and loop and try to access the element beyond the last index].

**Code:**

public class Ques2 {

    public static void main(String [] args){

        // Made an array

        int [] arr = {1,2,3,4,5};

        // kept in try catch block to handle the exception that may arise

        try{

            // When i=arr.length i.e when i=5 here at that iteration exception will be thrown

            for(int i=0; i<=arr.length; i++){

                System.out.println("Element at index "+i+": "+arr[i]);

            }

        }

        // Throwing ArrayIndexOutOfBoundsException while accessing elements out of index in array

        catch(ArrayIndexOutOfBoundsException e){

            System.out.println("Error: Array index out of bounds");

        }

    }

}

**Output:**

