

## Lab 05

1. Hands-on Exercise Objective After completing the hands-on exercises, you will be able to:

### Problem Statement 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 "<Tax Amount>**
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"**

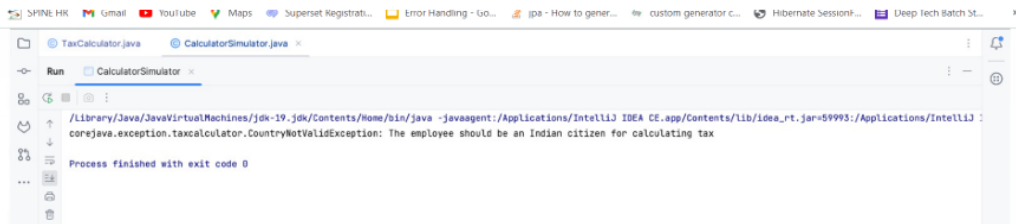
The following test cases to be executed, change the data in main method and run it and verify the output messages

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

### Expected output 1:



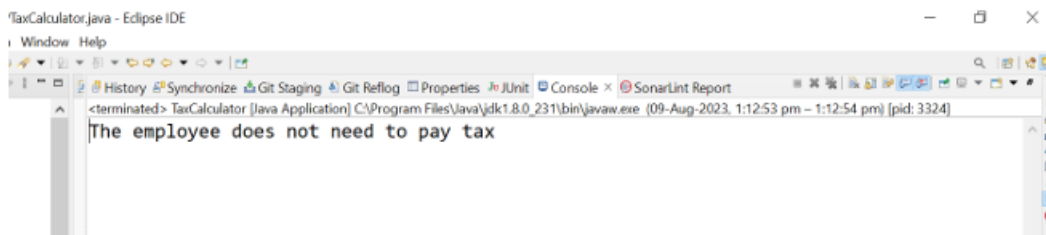
### Expected output 2:



### Expected Output 3:

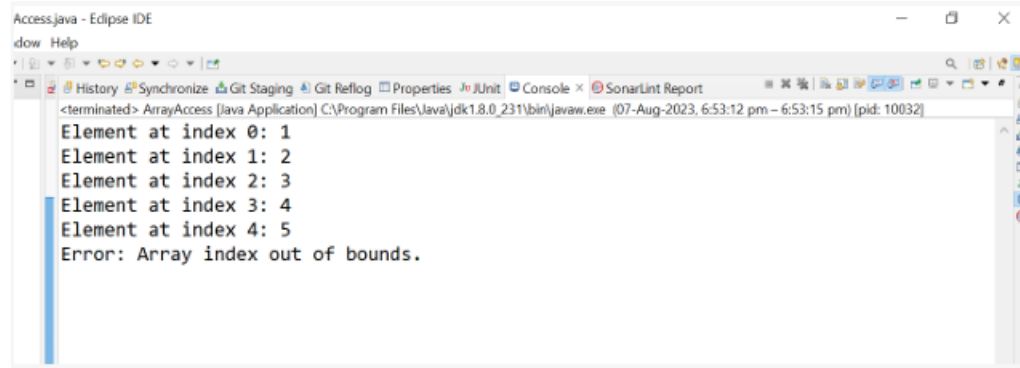


### Expected Output 4:



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]

Expected output:



The screenshot shows the Eclipse IDE interface with the 'Console' tab selected. The console output displays the results of an array access operation. It lists elements at indices 0 through 4, with values 1, 2, 3, 4, and 5 respectively. Following these outputs, an error message is displayed: 'Error: Array index out of bounds.' The IDE window title is 'Access.java - Eclipse IDE'. The console tab title is '<terminated> ArrayAccess [Java Application] C:\Program Files\Java\jdk1.8.0\_231\bin\javaw.exe (07-Aug-2023, 6:53:12 pm - 6:53:15 pm) [pid: 10032]'. The console output is as follows:

```
<terminated> ArrayAccess [Java Application] C:\Program Files\Java\jdk1.8.0_231\bin\javaw.exe (07-Aug-2023, 6:53:12 pm - 6:53:15 pm) [pid: 10032]
Element at index 0: 1
Element at index 1: 2
Element at index 2: 3
Element at index 3: 4
Element at index 4: 5
Error: Array index out of bounds.
```