Ramaiah Institute of Technology
(Autonomous Institute, Affiliated to VTU)
Department of Computer Science & Engineering

Advanced Java Laboratory (CSL56)

USN: **Week #: 01**

Semester: **Section:** **Date:**

Instructions:

- **Implement the following programs using java language.**

Programs:

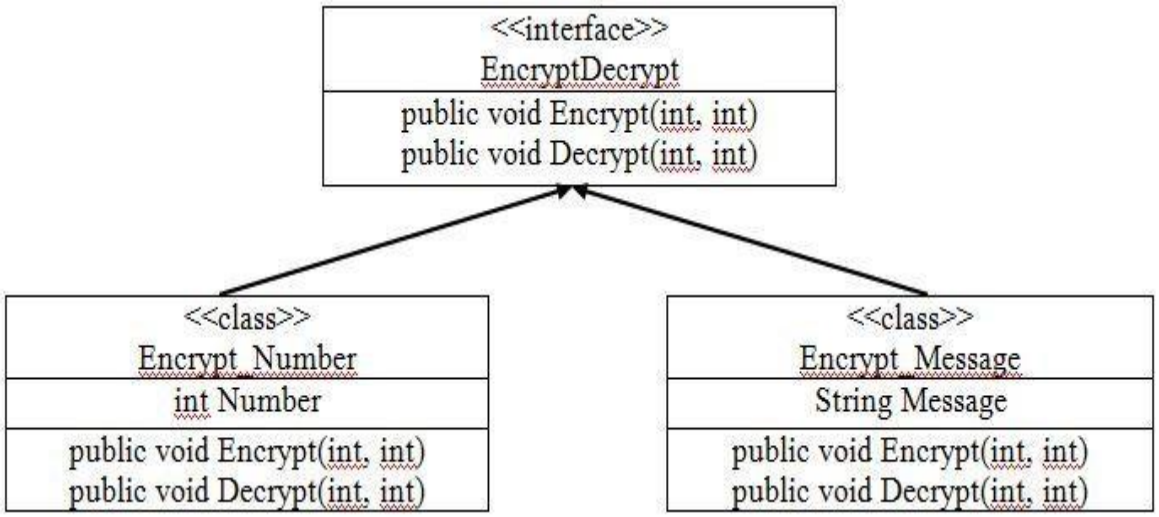
1. Write a Java program to create a class called as "Invoice" with following data members and member functions. Declare and use the array of objects to add different items to the cart. Write the calculateTax() function where GST tax is calculated. Write the printInvoice() function where the final bill is generated.

   Note: There are four types of items. Type 1 has 5% GST. Type 2 has 12% GST. Type 3 has 18% GST. Type 4 has 28% GST.

Invoice
private item_id : Integer private item_name : String private item_type : Integer private item_quantity : Integer private item_price : Double
void getDetails() void setDetails() private double calculateTax(item_type, item_price) void printInvoice()

2. Write a Java program to create an abstract class called as "Shape" and subclasses as “Rectangle”, “Triangle” and “Circle” with following data members and member functions. Demonstrate the dynamic method dispatch.

3. Write a Java program to implement the Caesar Cipher algorithm to Encrypt and Decrypt a PhoneNumber and a MailID. Create a EncryptDecrypt interface with Encrypt() & Decrypt() methods. First argument in the method specifies the forward(1) or backward(2) encryption and second argument specifies the step count. Perform the encryption & decryption for both phone number and mailid. (Ex: Encrypt(1, 3, “ABC”) → “DEF” Encrypt(2, 3, “ABC”) → “XYZ”)



4. Write a Java program to create a package "NumberConversion". Write 3 classes in the package. Class 1 will have methods to convert a number to binary form and from binary to number form. Class 2 will have methods to convert a number to octal form and from octal to number form. Class 3 will have methods to convert a number to hexadecimal form and from hexadecimal to number form. Write a Main class to implement these functions.

5. Write a multithreaded program to display prime numbers between 1-100 using thread1 and 101-200 using thread2 using a synchronized displayPrime(int n) function. Demonstrate the usage of synchronized function and synchronized blocks.

6. Write a Java program to prompt the user to enter his/her age and the CGPA. The user application for a job will be rejected either if his age is greater than 25 years or his CGPA is less than 8. Declare two nested try-throw-catch blocks; one to handle the **AgeOutOfRangeException** and the other to handle the **LowCGpaException**. If the user enters acceptable age and CGPA, display the message "Your application is accepted and is under study".

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EVALUATION			
Program	**Remarks**	**Marks**	**Faculty Signature**
Invoice Calculation Program			
Abstract Class Program			
Caesar Cipher Program			
Number Conversion Program			
Multithreaded Program			
Exception Program			