1.Implement a package LibraryManagement with classes Book and Member. The Book

class should have attributes like title, author, and ISBN, while the Member class should

store member details. Use this package to create a simple library system.

—>

Main method:

```
import library.book;
import library.member;
public class library_main {
   public static void main(String []args){
   book b = new book("To Kill a Mockingbird", "Harper Lee", "1960");
   member m = new member("M202", "John Doe", "2025-04-14");
   b.show_details();
   m.showDetails();
   }
}
```

Book Class:

```
package library;
public class book{
   String name;
   String author;
   String year;
   public book(String n,String a,String y){
      name = n;
      author = a;
      year = y;
   }
   public void show_details(){
      System.out.println("____Book Details_____");
      System.out.println("The name of the book:"+name);
      System.out.println("The name of the author:"+author);
      System.out.println("The year when the book is published:"+year);
   }
}
```

Member Class:

```
package library;
public class member {
   String memberId;
   String memberName;
   String membershipDate;
   public member(String id, String name, String date) {
      memberId = id;
      memberName = name;
      membershipDate = date;
   }
   public void showDetails() {
      System.out.println("____Member Details_____");
      System.out.println("Member ID: " + memberId);
      System.out.println("Member Name: " + memberName);
      System.out.println("Membership Date: " + membershipDate);    }
}
```

2.Create a package Ecommerce containing classes Product, Customer, and Order.

Implement methods for placing an order, displaying product details, and calculating total

order cost. Use this package in another program.

—>

Main:

```
import Ecommerce.*;

public class Main{
    public static void main(String[] args){
        Product product = new Product("Key board", 699.9, 2213);
        Customer customer = new Customer("YZ", 5322);
        Order order = new Order(customer,product,2);
        order.place_order();
    }
}
```

Customer:

```
package Ecommerce;

public class Customer{
    String name;
    int customer_id;
    public Customer(String n, int cid){
        name = n;
        customer_id = cid;
    }
    public void display_customer(){
        System.out.println("-----customer details-------");
        System.out.println("Customer ID: " + customer_id);
        System.out.println("Cusomer Name: "+ name);
    }}
```

Order:

```
package Ecommerce;

public class Order{
    Product product;
    Customer customer;
    int quantity;
    public Order(Customer c, Product p, int q){
        this.customer = c;
        this.product = p;
        this.quantity = q;
    }
    public void place_order(){
        System.out.println("====Order Placed!====");
        customer.display_customer();
        product.display_product();
        System.out.println("Quantity: " + quantity);
        System.out.println("Total cost(int RS): " + calculate_cost());
    }
    double calculate_cost(){
        return product.price * quantity;
    }
}
```

Product:

```
package Ecommerce;

public class Product{

    String name;

    double price;

    int product_id;

    public Product(String n, double p, int pid){

        name = n;

        price = p;

        product_id = pid;

    }

    public void display_product(){

        System.out.println("-----Product details------");

        System.out.println("Product name: " + name);

        System.out.println("Price(in RS): " + price);

        System.out.println("Product ID: " + product_id);

    }

}
```

3.Create a package named MathOperations that contains classes for mathematical

functions like floor, round, and ceil. Implement a program that uses these functions to

perform operations on different numbers. (The Math class in Java contains the methods

floor(), ceil(), and round())

—>

Math-main:

```
import MathOperations.Mathop;

public class math_main {

    public static void main(String[] args){

        Mathop math = new Mathop();

        System.out.println("-----operations on 2.6--------");

        math.operations(2.6);

        System.out.println("----operations on -7.5--------");

        math.operations(-7.5);

    }

}
```

Mathop:

```
package MathOperations;

 public class Mathop{

    public void operations(double number){

        System.out.println("Original Number: " + number);

        System.out.println("Floor: " + Math.floor(number));

        System.out.println("Ceil: " + Math.ceil(number));

        System.out.println("Round: " + Math.round(number));

    }

 }
```

4.Develop a mathematical package for Statistical operations like factorial, cube. Create a sub package in the math package - convert. In "convert" package provide classes to convert decimal to octal, binary, hex and vice-versa. Develop application program to use this package.

Operation.java

```
package Maths;
```

```
import java.util.*;
public class Operation{
public int num;
public void  getNum(){
Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        num = sc.nextInt();
}
public void factorial(){
if(num==0){
System.out.println("Factorial of 0 is 1");
return;
}
int fact=1;
for(int i=num;i>0;i--){
fact*=i;
}
System.out.println("Factorial
of"+num+"is:"+fact);
}
public void cube(){
double c=num*num*num;
System.out.println("Cube
of"+num+"is"+c);
}
}
```

Conversion.java

```
package Maths.Convert;
import Maths.Operation;
public class Conversion {
    Operation op;
public Conversion(Operation op) {
        this.op = op;
    }
public void toBinary() {
        System.out.println("Binary: " +
Integer.toBinaryString(op.num));
    }
public void toOctal() {
        System.out.println("Octal: " +
Integer.toOctalString(op.num));
    }
 public void toHex() {
        System.out.println("Hexadecimal: " +
Integer.toHexString(op.num));
    }
}
```

Main.java

```
import Maths.Operation;
import  Maths.Convert.Conversion;
class Main{
public static void main(String [] args){
Operation op=new Operation ();
Conversion convert=new Conversion(op);
op.getNum();
op.factorial();
op.cube();
convert.toBinary();
convert.toOctal();
convert.toHex();
}}
```

5. Write a Java program to perform employee payroll processing using packages. In the java file, Emp.java creates a package employee and creates a class Emp. Declare the variables name, empid, category, bpay, hra, da, npay, pf, grosspay, incometax, and allowance. Take da 5%,

hra 9%, pf 11% and allowance 10% of bpay. Calculate the values in methods. Create another java file Emppay java. Create an object e to call the methods to perform and print values.

Emp.java

```
package employee;

public class Emp {

   String name;

   int empid;

   String category;

   double bpay, hra, da, npay, pf, grosspay, incometax, allowance;

public Emp(String name, int empid, String category, double bpay) {

       this.name = name;

       this.empid = empid;

       this.category = category;

       this.bpay = bpay;

   }

public void calculatePay() {

        da = bpay * 0.05;  // 5% of basic pay

       hra = bpay * 0.09; // 9% of basic pay

       pf = bpay * 0.11;  // 11% of basic pay

       allowance = bpay * 0.10; // 10% of basic pay

       grosspay = bpay + hra + da + allowance;

 npay = grosspay - pf;

incometax = grosspay * 0.10; // 10% income tax

  npay = npay - incometax;

   }

 public void printPayroll() {

       System.out.println("Employee ID: " + empid);

       System.out.println("Name: " + name);

       System.out.println("Category: " + category);

       System.out.println("Basic Pay: " + bpay);

       System.out.println("HRA: " + hra);

       System.out.println("DA: " + da);

       System.out.println("Allowance: " + allowance);

       System.out.println("Gross Pay: " + grosspay);

       System.out.println("Provident Fund (PF): " + pf);

       System.out.println("Income Tax: " + incometax);

       System.out.println("Net Pay (after tax): " + npay);

   }

}
```

Employee.java

```
import employee.Emp;

public class Employee {

   public static void main(String[] args) {

      Emp e = new Emp("Snehal Vibhute", 1001, "Manager", 50000);

       e.calculatePay();

       e.printPayroll();

   }

}
```