**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();

}

}