**Oop’s Programing**

1. **Library Management System**

**Book Class Creation with Attributes:**

**// Book class creation**

**public class Book {**

**private int bookId;**

**private String title;**

**private String author;**

**private boolean isAvailable;**

**Constructor for book Class:**

**// Constructor to initialize book attributes**

**public Book(int bookId, String title, String author) {**

**this.bookId = bookId;**

**this.title = title;**

**this.author = author;**

**this.isAvailable=true;**

**}**

**Getter method for Attribute(Bookid, Title, Author):**

**// Getter Setter method for the Book class properties**

**public int getBookId(){**

**return bookId;**

**}**

**public String gettitle(){**

**return title;**

**}**

**public String getauthor(){return author;}**

**public boolean getisAvailable(){return isAvailable;}**

**Library Class Creation and Constructor Creation:**

**// Method to display book**

**public void displayBook(){**

**if (count==0){**

**System.*out*.println("No books in the Library!");**

**return;**

**}**

**for (int i = 0; i < count; i++) {**

**System.*out*.println(books[i]);**

**}**

**}**

**Method for Add Books**

**// Method to add book**

**public void addBook(Book book){**

**if (count<books.length){**

**books[count++]=book;**

**System.*out*.println("Book added Successfully!!");**

**}else {**

**System.*out*.println("Library is full!");**

**}**

**}**

**Method for Remove Books**

**// Method to Remove book**

**public void removeBook(int bookId){**

**for (int i = 0; i < count; i++) {**

**if (books[i].getBookId()==bookId){**

**books[i]=books[count-1];**

**books[count-1]=null;**

**count--;**

**System.*out*.println("Book removed Successfully!!");**

**return;**

**}**

**}**

**System.*out*.println("Book not found!");**

**}**

**Method for Search Books**

**// Method to Search book**

**public Book searchBook(int bookId){**

**for (int i=0;i<count;i++){**

**if (books[i].getBookId()==bookId){**

**return books[i];**

**}**

**}return null;**

**}**

**Method for Display Books:**

**// Method to display book**

**public void displayBook(){**

**if (count==0){**

**System.*out*.println("No books in the Library!");**

**return;**

**}**

**for (int i = 0; i < count; i++) {**

**System.*out*.println(books[i]);**

**}**

**}**

**Book Management System Class Creation:**

**// Management class Creation**

**class BookManagementSystem{**

**public static void main(String[]args){**

**Scanner scanner=new Scanner(System.*in*);**

**Library library=new Library(2);**

**while(true){**

**System.*out*.println("\nLibrary Management System");**

**System.*out*.println("1. Add Book");**

**System.*out*.println("2. Remove Book");**

**System.*out*.println("3. Search Book");**

**System.*out*.println("4. Display Book");**

**System.*out*.println("5.Exit");**

**System.*out*.println("Choose an Option: ");**

**int choice=scanner.nextInt();**

**switch (choice){**

**case 1:**

**System.*out*.println("Enter book id: ");**

**int id=scanner.nextInt();**

**scanner.nextLine();**

**System.*out*.print("Enter Title: ");**

**String title=scanner.nextLine();**

**System.*out*.print("Enter Author: ");**

**String author=scanner.nextLine();**

**library.addBook(new Book(id,title,author));**

**break;**

**case 2:**

**System.*out*.println("Enter Book id to Remove: ");**

**int removeId=scanner.nextInt();**

**library.removeBook(removeId);**

**break;**

**case 3:**

**System.*out*.println("Enter Book id to Search: ");**

**int searchId=scanner.nextInt();**

**Book book=library.searchBook(searchId);**

**if (book != null) {**

**System.*out*.println("Book Found: "+book);**

**}else{**

**System.*out*.println("Book not Found");**

**}**

**break;**

**case 4:**

**library.displayBook();**

**break;**

**case 5:**

**System.*out*.println("Exiting...");**

**scanner.close();**

**return;**

**default:**

**System.*out*.println("Invalid choice. Try again.");**

**}**

**}**

**}**

**OUT PUT :**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**1**

**Enter book id:**

**1**

**Enter Title: The Psychology of Money**

**Enter Author: Morgan Housel**

**Book added Successfully!!**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**1**

**Enter book id:**

**2**

**Enter Title: Man's Search for Meaning**

**Enter Author: Viktor Frankl**

**Book added Successfully!!**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**1**

**Enter book id:**

**3**

**Enter Title: The Alchemist**

**Enter Author: Paulo Coelho**

**Library is full!**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**4**

**Book Id: 1**

**Book Title: The Psychology of Money**

**Book Author: Morgan Housel**

**Available: true**

**Book Id: 2**

**Book Title: Man's Search for Meaning**

**Book Author: Viktor Frankl**

**Available: true**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**3**

**Enter Book id to Search:**

**2**

**Book Found: Book Id: 2**

**Book Title: Man's Search for Meaning**

**Book Author: Viktor Frankl**

**Available: true**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**2**

**Enter Book id to Remove:**

**1**

**Book removed Successfully!!**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**4**

**Book Id: 2**

**Book Title: Man's Search for Meaning**

**Book Author: Viktor Frankl**

**Available: true**

**Library Management System**

**1. Add Book**

**2. Remove Book**

**3. Search Book**

**4. Display Book**

**5.Exit**

**Choose an Option:**

**5**

**Exiting...**

**Process finished with exit code 0**

**2.)Calculating Employee Income Tax and Sales Tax**

**Taxable Interface Creation with Attributes and abstract method:**

**// Taxable interface Creation with SalesTax IncomeTax**

**interface Taxable{**

**double *salesTax*=0.07;**

**double *incomeTax*= 0.105;**

**// Abstract method calcTax**

**double calcTax();**

**}**

**Employee class Creation with implement of Taxable interface**

**// Employee Class creation with empid, name, salary parameters**

**//and it's implements Taxable interface**

**class Employee implements Taxable{**

**int empId;**

**String name;**

**double salary;**

**// Constructor for Employee Class**

**public Employee(int empId, String name, double salary) {**

**this.empId = empId;**

**this.name = name;**

**this.salary = salary;**

**}**

**Method for Calculate income Tax:**

**// method declaration for calculate income tax**

**public double calcTax(){**

**return salary\**incomeTax*;**

**}**

**Product class Creation with implement of Taxable interface**

**// Product Class creation with pid, price, quantity parameters**

**//and it's implements Taxable interface**

**class Product implements Taxable{**

**int pid;**

**int price;**

**int quantity;**

**// Constructor for Product Class**

**public Product(int pid, int price, int quantity) {**

**this.pid = pid;**

**this.price = price;**

**this.quantity = quantity;**

**}**

**Method for Calculate Sales Tax:**

**// method declaration for calculate Sales tax**

**public double calcTax(){**

**return price\**salesTax*;**

**}**

**DriverMain class Creation**

**// DriveMain class Creation**

**public class DriverMain{**

**// Main method**

**public static void main(String[]args){**

**Scanner scanner=new Scanner(System.*in*);**

**// Get a employee info from the user**

**System.*out*.println("Enter Employee Id: ");**

**int empid=scanner.nextInt();**

**scanner.nextLine();**

**System.*out*.print("Enter Employee Name: ");**

**String name=scanner.nextLine();**

**System.*out*.print("Enter Employee Salary: ");**

**double salary=scanner.nextDouble();**

**Employee emp=new Employee(empid, name, salary);**

**// Print Employee's Income Tax**

**System.*out*.println("Income Tax for "+emp.name+": "+emp.calcTax());**

**// Get a product info from the user**

**System.*out*.println("\nEnter Product Id: ");**

**int pid=scanner.nextInt();**

**System.*out*.println("Enter Product Price: ");**

**int price=scanner.nextInt();**

**System.*out*.println("Enter Product Quantity: ");**

**int quantity=scanner.nextInt();**

**Product prod=new Product(pid,price,quantity);**

**// Print Employee's sales Tax**

**System.*out*.println("Sales Tax on Product: "+prod.calcTax());**

**}**

**OUT PUT:**

**Enter Employee Id:**

**1**

**Enter Employee Name: John**

**Enter Employee Salary: 500000**

**Income Tax for John: 52500.0**

**Enter Product Id:**

**1**

**Enter Product Price:**

**350**

**Enter Product Quantity:**

**3**

**Sales Tax on Product: 24.500000000000004**