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Assigment no 1

Assignment title:

Write a java program to implement a small project to understand the basic concept of OOP

Code: // Book class demonstrating encapsulation

class Book {

    private String title;

    private String author;

    private int pages;

    // Constructor to initialize Book object

    public Book(String title, String author, int pages) {

        this.title = title;

        this.author = author;

        this.pages = pages;

    }

    // Getter methods (Encapsulation)

    public String getTitle() {

        return title;

    }

    public String getAuthor() {

        return author;

    }

    public int getPages() {

        return pages;

    }

    // Method to display book information (Abstraction)

    public void displayInfo() {

        System.out.println("Book Title: " + title);

        System.out.println("Author: " + author);

        System.out.println("Pages: " + pages);

    }

}

// EBook class extending Book class (Inheritance)

class EBook extends Book {

    private String format;

    // Constructor to initialize EBook object

    public EBook(String title, String author, int pages, String format) {

        super(title, author, pages); // Call parent class constructor

        this.format = format;

    }

    // Getter method for format

    public String getFormat() {

        return format;

    }

    // Overriding the displayInfo method (Polymorphism)

    @Override

    public void displayInfo() {

        super.displayInfo(); // Call the superclass method

        System.out.println("Format: " + format);

    }

}

// Library class to manage books

class Library {

    private Book[] books;

    private int currentIndex = 0;

    // Constructor to initialize the library with a certain size

    public Library(int size) {

        books = new Book[size];

    }

    // Method to add a book to the library

    public void addBook(Book book) {

        if (currentIndex < books.length) {

            books[currentIndex++] = book;

        } else {

            System.out.println("Library is full, cannot add more books.");

        }

    }

    // Method to display all books in the library

    public void displayAllBooks() {

        for (int i = 0; i < currentIndex; i++) {

            books[i].displayInfo();

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

        }

    }

}

// Main class to test the Library system

public class Main {

    public static void main(String[] args) {

        // Create some books

        Book book1 = new Book("The Great Gatsby", "F. Scott Fitzgerald", 180);

        EBook eBook1 = new EBook("Digital Fortress", "Dan Brown", 340, "PDF");

        // Create a library and add books

        Library library = new Library(5);

        library.addBook(book1);

        library.addBook(eBook1);

        // Display all books in the library

        library.displayAllBooks();

    }

}

