**package** LAB\_Problem**.**Problem2**;**

*import* java**.**util**.**ArrayList**;**

*import* java**.**util**.**List**;**

class LibraryItem {

*int* id**;**

    String title**;**

    String author**;**

*int* publicationYear**;**

*boolean* available**;**

*public* LibraryItem(*int* **id,** String **title,** String **author,** *int* **publicationYear**) {

*this***.***id* **=** id**;**

*this***.***title* **=** title**;**

*this***.***author* **=** author**;**

*this***.***publicationYear* **=** publicationYear**;**

*this***.***available* **=** true**;**

    }

*public* *void* checkOut() {

**if** (available) {

            available **=** false**;**

            System**.***out***.**println(title **+** " has been checked out.")**;**

        } **else** {

            System**.***out***.**println(title **+** " is already checked out.")**;**

        }

    }

*public* *void* returnItem() {

        available **=** true**;**

        System**.***out***.**println(title **+** " has been returned.")**;**

    }

*public* *boolean* isAvailable() {

**return** available**;**

    }

*public* String getDetails() {

**return** "ID: " **+** id **+** ", Title: " **+** title **+** ", Author: " **+** author **+**

                ", Year: " **+** publicationYear **+** ", Available: " **+** available**;**

    }

}

class Book *extends* *LibraryItem* {

    String ISBN**;**

    String genre**;**

*int* pages**;**

*public* Book(*int* **id,** String **title,** String **author,** *int* **publicationYear,** String **ISBN,** String **genre,** *int* **pages**) {

*super*(id**,** title**,** author**,** publicationYear)**;**

*this***.***ISBN* **=** ISBN**;**

*this***.***genre* **=** genre**;**

*this***.***pages* **=** pages**;**

    }

*public* String getGenre() {

**return** genre**;**

    }

*public* *int* getPageCount() {

**return** pages**;**

    }

    @**Override**

*public* String getDetails() {

**return** *super***.**getDetails() **+** ", ISBN: " **+** ISBN **+** ", Genre: " **+** genre **+** ", Pages: " **+** pages**;**

    }

}

class Journal *extends* *LibraryItem* {

    String ISSN**;**

*int* volume**;**

*int* issueNumber**;**

*public* Journal(*int* **id,** String **title,** String **author,** *int* **publicationYear,** String **ISSN,** *int* **volume,** *int* **issueNumber**) {

*super*(id**,** title**,** author**,** publicationYear)**;**

*this***.***ISSN* **=** ISSN**;**

*this***.***volume* **=** volume**;**

*this***.***issueNumber* **=** issueNumber**;**

    }

*public* *int* getVolume() {

**return** volume**;**

    }

*public* *int* getIssueNumber() {

**return** issueNumber**;**

    }

    @**Override**

*public* String getDetails() {

**return** *super***.**getDetails() **+** ", ISSN: " **+** ISSN **+** ", Volume: " **+** volume **+** ", Issue: " **+** issueNumber**;**

    }

}

class DVD *extends* *LibraryItem* {

*int* duration**;**

    String format**;**

    String regionCode**;**

*public* DVD(*int* **id,** String **title,** String **author,** *int* **publicationYear,** *int* **duration,** String **format,**

            String **regionCode**) {

*super*(id**,** title**,** author**,** publicationYear)**;**

*this***.***duration* **=** duration**;**

*this***.***format* **=** format**;**

*this***.***regionCode* **=** regionCode**;**

    }

*public* *int* getDuration() {

**return** duration**;**

    }

*public* String getFormat() {

**return** format**;**

    }

    @**Override**

*public* String getDetails() {

**return** *super***.**getDetails() **+** ", Duration: " **+** duration **+** " mins, Format: " **+** format **+** ", Region Code: "

**+** regionCode**;**

    }

}

class Library {

    List**<**LibraryItem**>** items**;**

*public* Library() {

*this***.***items* **=** **new** ArrayList**<>**()**;**

    }

*public* *void* addItem(LibraryItem **item**) {

        items**.**add(item)**;**

        System**.***out***.**println("Added: " **+** item**.**getDetails())**;**

    }

*public* *boolean* removeItem(*int* **id**) {

**for** (LibraryItem item **:** items) {

**if** (item**.***id* **==** id) {

                items**.**remove(item)**;**

                System**.***out***.**println("Removed item with ID: " **+** id)**;**

**return** true**;**

            }

        }

        System**.***out***.**println("Item with ID " **+** id **+** " not found.")**;**

**return** false**;**

    }

*public* LibraryItem searchItem(String **title**) {

**for** (LibraryItem item **:** items) {

**if** (item**.***title***.**equalsIgnoreCase(title)) {

**return** item**;**

            }

        }

        System**.***out***.**println("Item with title '" **+** title **+** "' not found.")**;**

**return** null**;**

    }

*public* *void* displayAllItems() {

**if** (items**.**isEmpty()) {

            System**.***out***.**println("No items in the library.")**;**

**return;**

        }

**for** (LibraryItem item **:** items) {

            System**.***out***.**println(item**.**getDetails())**;**

        }

    }

}

*public* class LibraryManagementSystem {

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

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

        Book book **=** **new** Book(1**,** "The God of Small Things"**,** "Arundhati Roy"**,** 1997**,** "9780679457312"**,** "Fiction"**,** 340)**;**

        Journal journal **=** **new** Journal(2**,** "Indian Journal of Science and Technology"**,** "Various"**,** 2023**,** "0974-6846"**,** 15**,**

                8)**;**

        DVD dvd **=** **new** DVD(3**,** "Lagaan"**,** "Ashutosh Gowariker"**,** 2001**,** 224**,** "DVD"**,** "Region 5")**;**

        library**.**addItem(book)**;**

        library**.**addItem(journal)**;**

        library**.**addItem(dvd)**;**

        System**.***out***.**println("\nDisplaying all items:")**;**

        library**.**displayAllItems()**;**

        System**.***out***.**println("\nChecking out a book:")**;**

        book**.**checkOut()**;**

        System**.***out***.**println("\nReturning the book:")**;**

        book**.**returnItem()**;**

        System**.***out***.**println("\nSearching for a journal:")**;**

        LibraryItem foundItem **=** library**.**searchItem("Nature")**;**

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

            System**.***out***.**println("Found: " **+** foundItem**.**getDetails())**;**

        }

        System**.***out***.**println("\nRemoving an item:")**;**

        library**.**removeItem(2)**;**

        System**.***out***.**println("\nDisplaying all items after removal:")**;**

        library**.**displayAllItems()**;**

    }

}