YVETTE NJUGUNA

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JAVA PROJECT ASSIGNMENT

1 Create a java program that stores and manages library catalogue .The program should storebthe following details .ISBN ,Author,Publisher ,Year published .user should be able to perform the following add a book in the catalogue(static ,no return type ,no parameter) display all books in the catalogue ,remove a book in the catalogue ,issue a book and mark it as rented for a specificied amount of time eg 7 days 2) modify the program to store the details in arrays showcase using a program 3 )connec the program to adatabse insert the details into the database display the book details from the databse remove book/update a book from the databese ay other functionalities (eg check if the book is available for borrowing or it has been issued

**1 Using Class and Methods**:

import java.util.ArrayList;

class Book {

private String ISBN;

private String author;

private String publisher;

private int yearPublished;

private boolean isRented;

public Book(String ISBN, String author, String publisher, int yearPublished) {

this.ISBN = ISBN;

this.author = author;

this.publisher = publisher;

this.yearPublished = yearPublished;

this.isRented = false;

}

public String getISBN() {

return ISBN;

}

public String getAuthor() {

return author;

}

public String getPublisher() {

return publisher;

}

public int getYearPublished() {

return yearPublished;

}

public boolean isRented() {

return isRented;

}

public void rentBook() {

isRented = true;

}

public void returnBook() {

isRented = false;

}

}

class LibraryCatalogue {

private static ArrayList<Book> catalogue = new ArrayList<>();

public static void addBook(String ISBN, String author, String publisher, int yearPublished) {

Book newBook = new Book(ISBN, author, publisher, yearPublished);

catalogue.add(newBook);

}

public static void displayAllBooks() {

for (Book book : catalogue) {

System.out.println("ISBN: " + book.getISBN() + ", Author: " + book.getAuthor() +

", Publisher: " + book.getPublisher() + ", Year Published: " + book.getYearPublished());

}

}

public static void removeBook(String ISBN) {

for (Book book : catalogue) {

if (book.getISBN().equals(ISBN)) {

catalogue.remove(book);

break;

}

}

}

public static void issueBook(String ISBN) {

for (Book book : catalogue) {

if (book.getISBN().equals(ISBN) && !book.isRented()) {

book.rentBook();

System.out.println("Book with ISBN " + ISBN + " has been issued.");

return;

}

}

System.out.println("Book with ISBN " + ISBN + " is either not available or already rented.");

}

}

1. **Using Arrays**:

class LibraryCatalogue {

private static Book[] catalogue = new Book[10]; // assuming a fixed size of 10 books for demonstration

private static int bookCount = 0;

public static void addBook(String ISBN, String author, String publisher, int yearPublished) {

if (bookCount < catalogue.length) {

catalogue[bookCount] = new Book(ISBN, author, publisher, yearPublished);

bookCount++;

} else {

System.out.println("Catalogue is full. Cannot add more books.");

}

}

// Other methods (displayAllBooks, removeBook, issueBook) can remain the same.

}

3 **Using a Database**:

import java.sql.\*;

public class LibraryDatabase {

private static final String JDBC\_URL = "jdbc:mysql://localhost:3306/library";

private static final String USERNAME = "your\_username";

private static final String PASSWORD = "your\_password";

public static void insertBook(String ISBN, String author, String publisher, int yearPublished) {

try (Connection connection = DriverManager.getConnection(JDBC\_URL, USERNAME, PASSWORD)) {

String sql = "INSERT INTO books(ISBN, author, publisher, year\_published) VALUES (?, ?, ?, ?)";

try (PreparedStatement statement = connection.prepareStatement(sql)) {

statement.setString(1, ISBN);

statement.setString(2, author);

statement.setString(3, publisher);

statement.setInt(4, yearPublished);

statement.executeUpdate();

System.out.println("Book inserted into the database.");

}

} catch (SQLException e) {

e.printStackTrace();

}

}

public static void displayBooks() {

try (Connection connection = DriverManager.getConnection(JDBC\_URL, USERNAME, PASSWORD)) {

String sql = "SELECT \* FROM books";

try (Statement statement = connection.createStatement();

ResultSet resultSet = statement.executeQuery(sql)) {

while (resultSet.next()) {

System.out.println("ISBN: " + resultSet.getString("ISBN") +

", Author: " + resultSet.getString("author") +

", Publisher: " + resultSet.getString("publisher") +

", Year Published: " + resultSet.getInt("year\_published"));

}

}

} catch (SQLException e) {

e.printStackTrace();

}

}

public static void removeBook(String ISBN) {

try (Connection connection = DriverManager.getConnection(JDBC\_URL, USERNAME, PASSWORD)) {

String sql = "DELETE FROM books WHERE ISBN = ?";

try (PreparedStatement statement = connection.prepareStatement(sql)) {

statement.setString(1, ISBN);

int rowsDeleted = statement.executeUpdate();

if (rowsDeleted > 0) {

System.out.println("Book with ISBN " + ISBN + " removed from the database.");

} else {

System.out.println("Book with ISBN " + ISBN + " not found in the database.");

}

}

} catch (SQLException e) {

e.printStackTrace();

}

}

// Other methods for updating book details, checking availability, etc., can be added similarly.

}