import java.util.ArrayList;

import java.util.HashMap;

import java.util.Map;

import java.util.Scanner;

class Book {

private String title;

private String author;

public Book(String title, String author) {

this.title = title;

this.author = author;

}

public String getTitle() {

return title;

}

public String getAuthor() {

return author;

}

@Override

public String toString() {

return "Title: " + title + ", Author: " + author;

}

}

class Library {

private Map<String, Book> bookCatalog;

private Map<String, ArrayList<Book>> checkedOutBooks;

private Map<String, Integer> userBooksCount;

public Library() {

bookCatalog = new HashMap<>();

checkedOutBooks = new HashMap<>();

userBooksCount = new HashMap<>();

}

public void addBook(String title, String author) {

Book newBook = new Book(title, author);

bookCatalog.put(title, newBook);

}

public void displayCatalog() {

System.out.println("Library Catalog:");

for (Book book : bookCatalog.values()) {

System.out.println(book);

}

}

public void checkOutBook(String username, String title) {

Book book = bookCatalog.get(title);

if (book != null) {

checkedOutBooks.computeIfAbsent(username, k -> new ArrayList<>()).add(book);

userBooksCount.merge(username, 1, Integer::sum);

bookCatalog.remove(title);

System.out.println("Book checked out successfully.");

} else {

System.out.println("Book not found in the catalog.");

}

}

public void returnBook(String username, String title) {

ArrayList<Book> userBooks = checkedOutBooks.get(username);

if (userBooks != null) {

Book returnedBook = null;

for (Book book : userBooks) {

if (book.getTitle().equals(title)) {

returnedBook = book;

break;

}

}

if (returnedBook != null) {

checkedOutBooks.get(username).remove(returnedBook);

userBooksCount.merge(username, -1, Integer::sum);

bookCatalog.put(title, returnedBook);

System.out.println("Book returned successfully.");

} else {

System.out.println("Book not found in the user's checked-out books.");

}

} else {

System.out.println("User not found or user has no checked-out books.");

}

}

public void displayCheckedOutBooks(String username) {

ArrayList<Book> userBooks = checkedOutBooks.get(username);

if (userBooks != null) {

System.out.println("Checked-out books for " + username + ":");

for (Book book : userBooks) {

System.out.println(book);

}

} else {

System.out.println("User not found or user has no checked-out books.");

}

}

public int getUserBooksCount(String username) {

return userBooksCount.getOrDefault(username, 0);

}

}

public class LibraryManagementSystem {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

Library library = new Library();

while (true) {

System.out.println("\nLibrary Management System Menu:");

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

System.out.println("2. Display Catalog");

System.out.println("3. Check Out Book");

System.out.println("4. Return Book");

System.out.println("5. Display Checked-out Books");

System.out.println("6. Exit");

System.out.print("Enter your choice: ");

int choice = scanner.nextInt();

scanner.nextLine(); // Consume the newline character

switch (choice) {

case 1:

System.out.print("Enter book title: ");

String title = scanner.nextLine();

System.out.print("Enter author name: ");

String author = scanner.nextLine();

library.addBook(title, author);

System.out.println("Book added successfully.");

break;

case 2:

library.displayCatalog();

break;

case 3:

System.out.print("Enter your username: ");

String checkOutUsername = scanner.nextLine();

System.out.print("Enter the title of the book to check out: ");

String checkOutTitle = scanner.nextLine();

library.checkOutBook(checkOutUsername, checkOutTitle);

break;

case 4:

System.out.print("Enter your username: ");

String returnUsername = scanner.nextLine();

System.out.print("Enter the title of the book to return: ");

String returnTitle = scanner.nextLine();

library.returnBook(returnUsername, returnTitle);

break;

case 5:

System.out.print("Enter your username: ");

String displayUsername = scanner.nextLine();

library.displayCheckedOutBooks(displayUsername);

break;

case 6:

System.out.println("Exiting Library Management System. Goodbye!");

System.exit(0);

default:

System.out.println("Invalid choice. Please enter a number between 1 and 6.");

}

}

}

}