Program Description: Library Management System

The **Library Management System** is a Java-based console application designed to assist librarians and library staff in managing their library's collection of books. This program provides a simple interface for performing essential operations related to the management of books, patrons, and borrowing activities.

Key Features

1. **Book Management**:
   - **Add Books**: Librarians can add new books to the library's inventory by entering details such as the title, author, ISBN, and the number of copies available.
   - **Remove Books**: Allows the removal of books from the inventory if they are no longer available or needed.
   - **Display Books**: Users can view a list of all books in the library, including their details, helping to keep track of the collection.
2. **Patron Management**:
   - **Register Patrons**: The system allows librarians to register new patrons, capturing essential information like name, ID, and contact details.
   - **View Patrons**: Librarians can view a list of registered patrons, making it easier to manage user information.
3. **Borrowing and Returning Books**:
   - **Borrow Books**: Patrons can borrow books from the library, and the system will track which books are currently checked out and which are available.
   - **Return Books**: Patrons can return books they have borrowed, updating the inventory accordingly and allowing other patrons to borrow those books.
4. **Search Functionality**:
   - The system allows users to search for books by title, author, or ISBN, making it easy to find specific books in the library's collection.
5. **User-Friendly Interface**:
   - The application features a simple text-based menu that guides users through the available operations. This design makes it accessible for users with varying levels of technical expertise.

Educational Objectives

This project aims to teach students the following key concepts:
- **Object-Oriented Programming (OOP)**: Students will learn how to create and use classes and objects, encapsulate data, and model real-world entities (like books and patrons).
- **Data Structures**: The program will utilize data structures (like lists or arrays) to manage collections of books and patrons efficiently.
- **Input and Output Handling**: Students will gain experience in handling user input and displaying output in a console application.

- **Basic Algorithm Design**: Students will implement algorithms for searching, adding, and removing items from collections, enhancing their problem-solving skills.