

Pustakalay - Library Management System

Overview

Pustakalay is a Java-based Library Management System developed for the VITyarthi project. It allows users (Students, Faculty) to search for and borrow books, while Admins can manage the book inventory.

Features

- **User Management:** Secure Login and Registration for Students, Faculty, and Admins.
- **Book Management:** Admin capabilities to Add and Remove books; User capabilities to Search books.
- **Transaction Management:** Seamless Issue and Return workflow with real-time status updates.
- **Interactive Frontend:** A modern, responsive web interface built with React and Tailwind CSS.
- **REST API:** A robust Java-based backend exposing REST endpoints.

Technologies/Tools Used

- **Language:** Java (JDK 8+)
- **Frontend:** HTML5, React.js (via CDN), Tailwind CSS
- **Backend:** Java com.sun.net.httpserver (No external frameworks)
- **Data Storage:** In-memory storage (simulated persistence)
- **Tools:** Git, VS Code/IntelliJ IDEA

Project Structure

```
Pustakalay/
├── src/
│   └── com/vityarthi/pustakalay/
│       ├── main/      # Entry point
│       ├── model/    # Data models (Book, User, Transaction)
│       ├── service/  # Business logic
│       └── api/      # REST API Handlers
├── frontend/        # React Frontend
└── docs/           # Design documentation
└── bin/            # Compiled classes
```

How to Run (CLI)

1. Compile:

```
javac -d bin src/com/vityarthi/pustakalay/model/*.java src/com/vityarthi/pustakalay/main/MainApp.java
```

2. Run:

```
java -cp bin com.vityarthi.pustakalay.main.MainApp
```

How to Run (Web App)

1. Compile API Server:

```
javac -d bin src/com/vityarthi/pustakalay/model/*.java src/com/vityarthi/pustakalay/api/APIServer.java
```

2. Start API Server:

```
java -cp bin com.vityarthi.pustakalay.api.APIServer
```

Server will start on `http://localhost:8080`.

3. Open Frontend:

- Navigate to `frontend/` folder.
- Open `index.html` in any modern web browser.
- Login with `S001 / student123`.

Default Credentials

- **Admin:** `A001 / admin123`
- **Student:** `S001 / student123`
- **Faculty:** `F001 / faculty123`

Instructions for Testing

1. User Registration:

- Go to the web interface.
- Click "Create one" to register a new account.
- Login with the new credentials.

2. Book Issue:

- Login as a Student.
- Find an "AVAILABLE" book.
- Click "Issue Book".
- Verify the status changes to "ISSUED".

3. Book Return:

- Find the book you issued.
- Click "Return Book".
- Verify the status changes back to "AVAILABLE".

4. Admin Functions:

- Login as Admin (`A001 / admin123`).
- (Note: Admin UI features are currently accessible via CLI or API).