

Project Documentation: Classroom Equipment Checkout System

I. Technology Stack and Architecture

This application is built on the widely used XAMPP stack, providing a local, cross-platform environment for development and deployment.

Component	Technology	Role in System
Development Environment	XAMPP	Provides the integrated package (Apache, MySQL, PHP) for local execution.
Web Server	Apache	Handles HTTP requests and serves the application files to the user's browser.
Database	MySQL	Stores all persistent data: student accounts, device inventory, and transaction records.
Database Manager	phpMyAdmin	Web-based interface used for easy database creation, import, and management.
Backend Logic	PHP	Executes server-side tasks, including security (2FA processing, password hashing), database interaction, and transaction logic.
Frontend	HTML, CSS, JavaScript	Structure, styling, and client-side interactivity for the user interface.
Version Control	Git	Used for cloning and managing the project's source code from the repository.

II. Installation Guide

This guide outlines the steps required to set up the Classroom Equipment Checkout System on a local machine.

Prerequisites

Ensure you have XAMPP (includes Apache, MySQL, PHP) and Git installed before proceeding.

Step-by-Step Installation

1. Clone the Repository

Open your command line interface and navigate to the XAMPP web root directory (htdocs). Then, clone the project:

- For Mac: `cd /Applications/XAMPP/htdocs/`
- For Windows: `cd C:\xampp\htdocs\`

Bash

```
git clone https://github.com/pillowyz/classroom-equipment-checkout.git
cd classroom-equipment-checkout
```

2. Start XAMPP Services

Open the XAMPP Control Panel. Click the Start button next to Apache and MySQL. Verify both are running (green status).

3. Set Up Database

- Go to: `http://localhost/phpmyadmin`
- Click "New" and create a database named: equipment
- Select the new equipment database.
- Go to the Import tab, select the file `database/equipment_database.sql`, and click Go.

4. Verify Database Structure

Confirm the successful creation of the following tables with sample data:

- **devices** (6 sample devices)
- **student** (1 test student)
- **transactions** (sample transactions)

5. Open the Application

Access the system login page in your web browser:

`http://localhost/classroom-equipment-checkout/frontend/index.html`

III. System Usage and Key Features

The system is designed to provide a secure and streamlined interface for students to manage equipment loans.

Test Credentials

Use these credentials for immediate access to the test student account:

Field	Value	Note
Email	student@email.com	Primary login ID.
Password	studentpassword	Associated password.
2FA Code	Any 6-digit number (123456)	Development Note: Any 6-digit code is accepted. In production, an actual code would be emailed.

A. Authentication and Security

The system uses a multi-step login process to verify the user:

1. Sign In: Enter email and password.
2. 2FA Verification: Enter the 6-digit code. This step is processed by the backend logic (PHP) to grant access to the main application interface.

B. Core Functional Tabs and Workflow

The application is structured around four main tabs, enabling a complete checkout lifecycle.

Feature Tab	Workflow and Action	Status Indicators & Updates
Browse Equipment	View-Only: Shows the complete inventory list.	Green Available: Ready to be checked out. Red Unavailable: Currently in use.
Checkout	Student selects an available item and initiates the loan.	Status in the database is automatically updated to "Checked Out" after confirmation.
My Items	Students track their active loans and view details.	Shows current checkout dates and expected return dates for all items linked to the student's ID.
Returning Equipment	Student initiates the return process from the "My Items" tab.	Clicks the "Return" button next to the item. The item's status in the database is automatically updated back to "Available".

C. Backend Process Summary

The backend system is responsible for critical transactional and status updates, ensuring data integrity:

1. **Transaction Record:** When equipment is checked out, a new record is created in the **transactions** table linking the `student_id` to the `device_id` and recording the `checkout_date`.
2. **Status Update:** The devices table is immediately updated to change the status from Available to Unavailable.
3. **Return Completion:** When equipment is returned, the transactions record is updated with the `actual_return_date`, and the devices table is updated to set the status back to Available.