**Laptop Rental Management System Documentation**

**1. Problem Statement**

In many universities, students from remote areas face challenges in completing academic projects and assignments due to the unavailability of laptops. Purchasing a laptop is often not feasible for these students due to financial constraints. This lack of access limits their ability to work on Final Year Projects (FYPs), university assignments, and freelance opportunities, which can impact their academic and professional growth.

**2. Proposed Solution**

To address this problem, we propose a Laptop Rental Management System that allows students to rent laptops for a specified duration. This system will facilitate students to complete their academic tasks without the burden of purchasing a laptop. The system will also ensure proper management of laptops, transactions, and student records through an efficient and user-friendly interface.

**3. Project Overview**

The Laptop Rental Management System will be developed in the C programming language. The project will follow a modular structure, dividing the workload into four distinct modules to be assigned to a team of four members. The system will include features such as student registration, laptop inventory management, rental transactions, search functionality, and user authentication.

**4. Project Overview**

This project was be managed using GitHub, enabling all team members to contribute effectively to the shared repository. The repository tracked changes, ensure proper version control, and streamline collaboration.

**GitHub Repository Link:** https://github.com/saadjangdaa/PFLab\_Project\_LRMS  
  
**System Credentials**

To ensure secure access, the system will include role-based authentication. Below are the sample credentials for the management system:

 **Student Login Credentials:**

* Username: user1
* Password: pass1

 **Admin Login Credentials:**

* Username: admin
* Password: admin123

**Folder Structure Overview**

The project files are organized into the following folders and files:

* **.git**: Contains version control data for the project managed via Git. This ensures all changes are tracked and contributions from team members are streamlined.
* **Booking\_Saad**: Contains code related to the laptop booking functionality.
* **Inventory\_Uqbah**: Holds the code responsible for managing the inventory of laptops.
* **PF\_Main\_Code**: This folder contains the main project code. This is the primary folder to execute the system. It also includes all necessary .txt files required for the project, such as Laptop-Data.txt and Student-Data.txt.
* **Registration\_Dina**: Includes the code for handling student registration.
* **Search\_Rafay**: Contains the implementation of the search functionality for students and laptops.
* **Project\_Documentation**: A Word document providing detailed project documentation, including problem statements, proposed solutions, and system credentials.
* **README**: A markdown file summarizing the project, its purpose, and basic setup instructions.

**Running the Code**

To run the project, navigate to the **PF\_Main\_Code** folder. This folder serves as the main entry point for the project. Ensure that the required .txt files (e.g., Laptop-Data.txt, Student-Data.txt) are present in the same directory to avoid any runtime issues.

**Steps to Run the Project:**

1. Open the **PF\_Main\_Code** folder in your preferred C compiler or IDE.
2. Compile the code using the compiler.
3. Execute the compiled code to launch the Laptop Rental Management System.
4. Use the provided credentials for login:
   * **Admin Credentials:** Username: admin, Password: admin123
   * **Student Credentials:** Username: user1, Password: pass1

**Features:**

* **Student Registration**: Register students with their details.
* **Laptop Inventory Management**: Maintain a record of available laptops.
* **Rental Transactions**: Manage the rental process, including booking and returns.
* **Authentication**: Ensure secure access for admins and students.
* **Search Functionality**: Allow users to search for laptops and student records.

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**Module Breakdown**

**Module 1: Registration and User Management**

**Description**:

* Register new students by collecting basic details such as name, student ID, and contact information.
* Store student details in a file for persistent storage.
* Implement functions to display, update, and search for student records.

**Key Functions**:

* registerStudent()
* displayStudents()
* searchStudent()

**Module 2: Laptop Inventory Management**

**Description**:

* Maintain a list of available laptops with details such as laptop ID, brand, and specifications.
* Add new laptops to the inventory and update their availability status.

**Key Functions**:

* addLaptop()
* displayLaptops()
* updateLaptopStatus()

**Module 3: Booking and Rental Transactions**

**Description**:

* Handle the process of booking laptops for students.
* Record rental details such as student ID, laptop ID, and rental duration.
* Manage laptop returns and update the inventory accordingly.

**Key Functions**:

* bookLaptop()
* returnLaptop()
* displayRentalTransactions()

**Module 4: Authentication and Search Functionality**

**Description**:

* Implement a login system with roles (admin and student).
* Validate user credentials against pre-defined data.
* Provide search functionality for laptops and students.

**Key Functions**:

* login()
* searchLaptop()
* searchStudent()

**5. Team Member Assignments**

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| **Team Member** | **Assigned Module** |
| Dina | Registration and User Management |
| Uqbah | Laptop Inventory Management |
| Saad Jangda | Booking and Rental Transactions |
| Abdul Rafay | Authentication and Search Functionality |

**6. Development Plan**

* **Phase 1**: Understand the requirements and design the module structure.
* **Phase 2**: Develop individual modules with file I/O for data storage.
* **Phase 3**: Integrate all modules and test the system.
* **Phase 4**: Finalize the project, prepare documentation, and conduct a demo.

**7. Tools and Technologies**

* **Programming Language**: C
* **Development Environment**: Code::DevC++, Visual Studio Code, or Turbo C++
* **File Format**: .txt files for data storage

**8. Conclusion**

The Laptop Rental Management System aims to provide an effective solution for students who lack access to laptops. By dividing the project into well-defined modules, each team member can focus on specific responsibilities, ensuring smooth development and successful completion of the project.