**Project Overview & Objectives**

**Our Project Idea: E-Library with Secure PDF Access for College Students**

**Overview**

The **E-Library with Secure PDF Access** is a web-based digital library platform built especially for **college students and faculty**.  
It provides a centralized and user-friendly system where students can **access study materials, notes, e-books, and research papers online** — while ensuring that all PDF files are **protected from unauthorized downloading, copying, or sharing**.

Traditional college libraries often face challenges like limited access hours, physical wear of books, and lack of digital security for soft copies. This project overcomes those issues by offering a **secure, cloud-based e-library** accessible anytime, anywhere.

**Purpose**

The purpose of this project is to help colleges **digitally manage and distribute academic materials** while maintaining strict **PDF security** and user-level access control.  
It ensures that educational content remains safe within the platform and can only be viewed by **authorized students and staff**.

**Key Features**

1. **Secure PDF Viewer:** Allows students to read PDFs online without download or copy options.
2. **User Authentication & Roles:** Admins, Faculty, and Students have separate login roles and privileges.
3. **Cloud-Based Storage:** All PDFs are stored securely using cloud storage (e.g., AWS S3 / Google Cloud).
4. **Organized Library:** Books and study materials are categorized by department, semester, and subject.
5. **Search & Filter:** Quickly find resources by name, author, or subject.
6. **Access Logs:** Tracks who viewed which materials and when, ensuring accountability.
7. **Admin Dashboard:** Manage users, uploads, and monitor activity.
8. **Responsive Interface:** Accessible on laptops, tablets, and smartphones.

**Objectives**

* Develop a **secure, web-based digital library** for college students.
* Implement **authentication and role-based access** to restrict unauthorized users.
* **Protect intellectual property** by preventing downloads or external sharing of PDFs.
* Provide **cloud-hosted access** to academic resources from anywhere.
* Enable **efficient management** of study materials by faculty and librarians.
* Encourage **paperless learning** and reduce physical dependency on printed materials.

**Expected Impact**

* Improved access to learning resources for all students.
* Enhanced security for academic documents and PDFs.
* Simplified resource management for faculty and admins.
* Supports sustainable, digital-first education.
* Promotes modernization of college library systems.

**Technology Stack & Environment Setup**

**1. Technology Stack**

| **Layer** | **Technology / Tool** | **Purpose** |
| --- | --- | --- |
| **Frontend** | **HTML5, CSS3, JavaScript** / React.js | Build responsive, interactive user interface for students and admins. |
| **Backend** | **Node.js + Express.js** | Server-side logic, REST API development, and authentication. |
| **Database** | **MySQL** | Store user data, book details, access logs, and role information. |
| **Authentication** | **JWT (JSON Web Tokens), bcrypt.js** | Secure login and access control using encrypted credentials. |
| **File Handling** | **Multer** | Upload and manage PDF files on the server. |
| **Cloud Storage** | **AWS S3 / Google Cloud Storage** | Secure storage for PDF files with controlled access. |
| **Secure PDF Viewer** | **PDF.js / iframe with restrictions** | Embed PDF securely, disable download and copy options. |
| **Security Tools** | **Helmet.js, CORS, dotenv, rate-limiter** | Protect the server from unauthorized access and attacks. |
| **Version Control** | **Git + GitHub** | Maintain project versions, collaborate, and track progress. |
| **Deployment** | **Render / Railway (Backend)**, **Vercel / Netlify (Frontend)** | Host and deploy web application. |
| **Testing Tools** | **Postman, Jest/Mocha** | API testing and backend validation. |
| **IDE / Editors** | **Visual Studio Code** | Development environment for coding and debugging. |