Full Stack Development with MERN

Project Documentation format

1. Introduction

- **Project Title:** LearnHub
- **Team Members:** Shaik Mohammed Yasin – Full Stack Developer
- **Team ID:** LTVIP2025TMID57521

2. Project Overview

- **Purpose:** LearnHub is a modern, minimalist digital learning platform that enables students to enroll in courses, track progress, and receive certificates, while teachers and admins can manage courses and users.
- **Features:**
  - User authentication (student, teacher, admin roles)
  - Course browsing, filtering, and enrollment
  - Video content delivery with progress tracking
  - Certificate generation and download
  - Admin dashboard for user and course management
  - Responsive, accessible, and cohesive UI

3. Architecture

- **Frontend:**
  - Built with React (Vite, Material-UI)
  - Component-based structure (pages, commonadmin, user, etc.)
  - State management via React Context and hooks
  - Responsive design with modern CSS
- **Backend:**
  - Node.js with Express.js,
  - RESTful API structure,
  - JWT-based authentication and role-based authorization,
  - Multer for file uploads (videos, thumbnails)
- **Database:**
- MongoDB (Mongoose ODM)
- Schemas for users, courses,
- enrollments, announcements, etc.

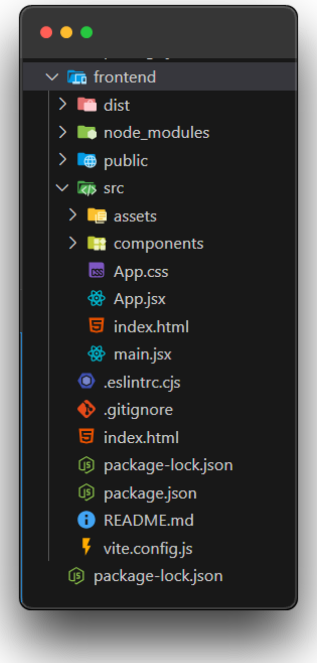
- Relationships: Users ↔ Courses ↔ Enrollments

4. Setup Instructions

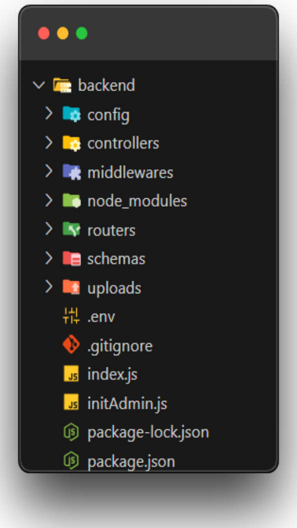
- **Prerequisites:**
- Node.js (v16+ recommended),
- MongoDB (local or Atlas)
- Git
- **Installation:** git clone [your-repo-url],
- cd code/backend,
- npm install,
- cd ../frontend,
- npm install,

5. Folder Structure

- **Client:** **Server:**



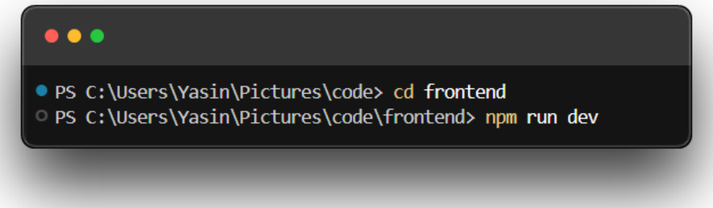
```
frontend
  dist
  node_modules
  public
  src
    assets
    components
    App.css
    App.jsx
    index.html
    main.jsx
  .eslintrc.cjs
  .gitignore
  index.html
  package-lock.json
  package.json
  README.md
  vite.config.js
package-lock.json
```



```
backend
  config
  controllers
  middlewares
  node_modules
  routers
  schemas
  uploads
  .env
  .gitignore
  index.js
  initAdmin.js
  package-lock.json
  package.json
```

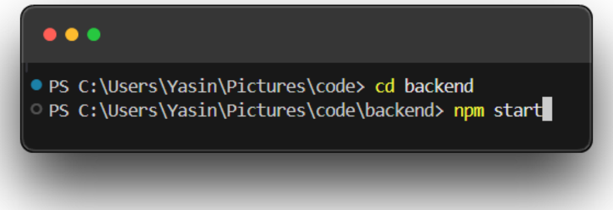
6. Running the Application:

Frontend:



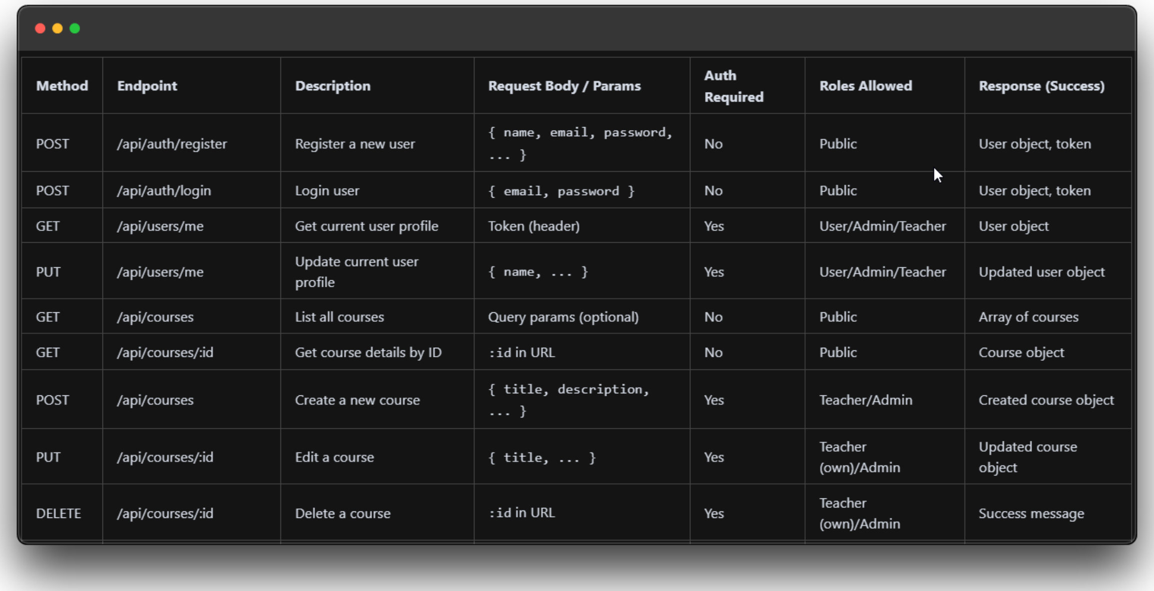
```
PS C:\Users\Yasin\Pictures\code> cd frontend
PS C:\Users\Yasin\Pictures\code\frontend> npm run dev
```

Backend:



```
PS C:\Users\Yasin\Pictures\code> cd backend
PS C:\Users\Yasin\Pictures\code\backend> npm start
```

7. API Documentation:



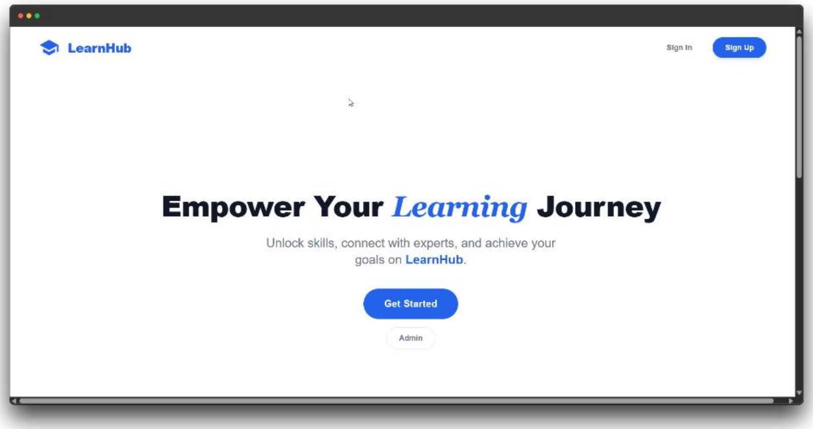
Method	Endpoint	Description	Request Body / Params	Auth Required	Roles Allowed	Response (Success)
POST	/api/auth/register	Register a new user	`{ name, email, password, ... }`	No	Public	User object, token
POST	/api/auth/login	Login user	`{ email, password }`	No	Public	User object, token
GET	/api/users/me	Get current user profile	Token (header)	Yes	User/Admin/Teacher	User object
PUT	/api/users/me	Update current user profile	`{ name, ... }`	Yes	User/Admin/Teacher	Updated user object
GET	/api/courses	List all courses	Query params (optional)	No	Public	Array of courses
GET	/api/courses/:id	Get course details by ID	:id in URL	No	Public	Course object
POST	/api/courses	Create a new course	`{ title, description, ... }`	Yes	Teacher/Admin	Created course object
PUT	/api/courses/:id	Edit a course	`{ title, ... }`	Yes	Teacher (own)/Admin	Updated course object
DELETE	/api/courses/:id	Delete a course	:id in URL	Yes	Teacher (own)/Admin	Success message

8. Authentication

1. JWT tokens issued on login, stored in localStorage.
2. Role-based access (student, teacher, admin).
3. Protected routes via middleware on backend and route guards on frontend.

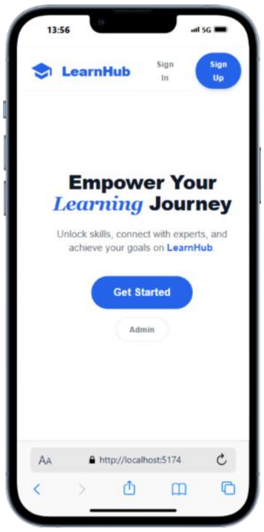
9. User Interface:

Home Page:



Empower Your *Learning* Journey

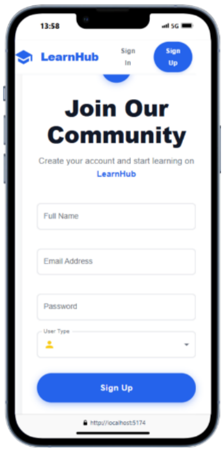
Unlock skills, connect with experts, and achieve your goals on LearnHub.



Empower Your *Learning* Journey

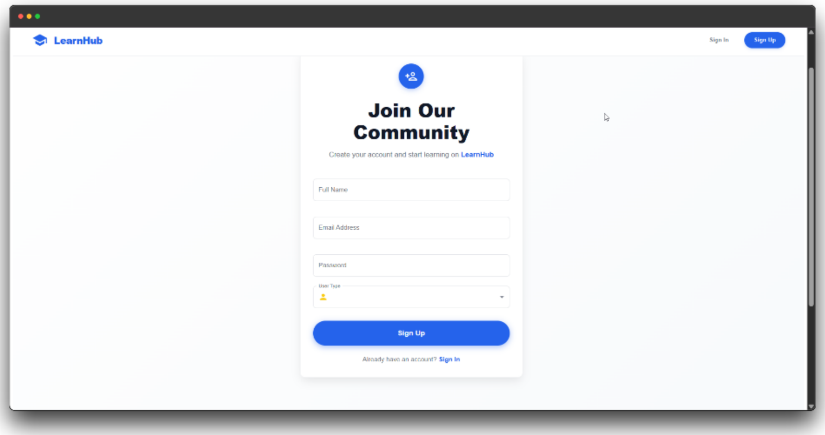
Unlock skills, connect with experts, and achieve your goals on LearnHub

Registration Form:



Join Our Community

Create your account and start learning on LearnHub

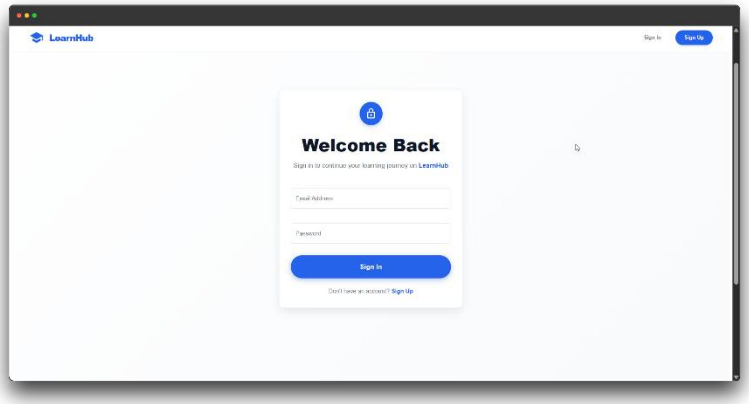


Join Our Community

Create your account and start learning on LearnHub

Already have an account? Sign In

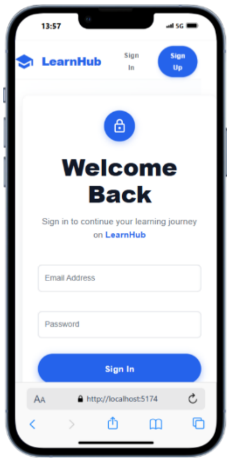
Login From:



Welcome Back

Sign in to continue your learning journey on LearnHub

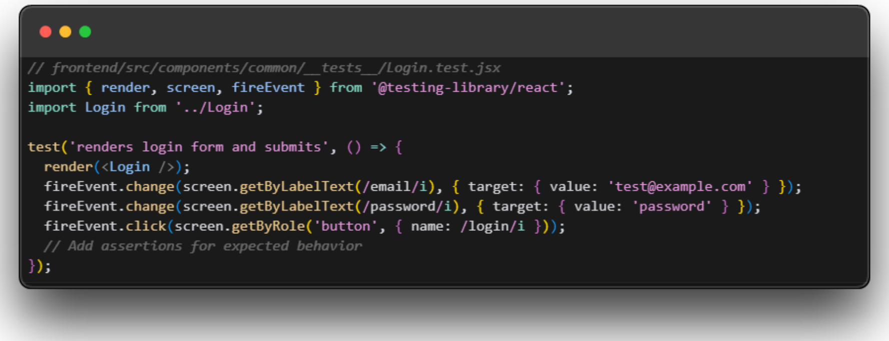
Don't have an account? Sign Up



Welcome Back

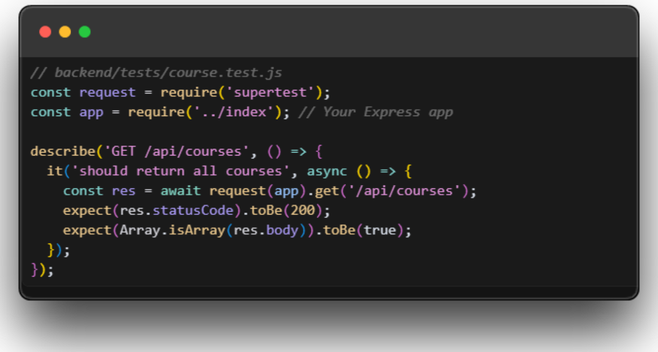
Sign in to continue your learning journey on LearnHub

10. Testing:



```
// frontend/src/components/common/__tests__/Login.test.jsx
import { render, screen, fireEvent } from '@testing-library/react';
import Login from '../Login';

test('renders login form and submits', () => {
  render(<Login />);
  fireEvent.change(screen.getByLabelText(/email/i), { target: { value: 'test@example.com' } });
  fireEvent.change(screen.getByLabelText(/password/i), { target: { value: 'password' } });
  fireEvent.click(screen.getByRole('button', { name: /login/i }));
  // Add assertions for expected behavior
});
```



```
// backend/tests/course.test.js
const request = require('supertest');
const app = require('../index'); // Your Express app

describe('GET /api/courses', () => {
  it('should return all courses', async () => {
    const res = await request(app).get('/api/courses');
    expect(res.statusCode).toBe(200);
    expect(Array.isArray(res.body)).toBe(true);
  });
});
```

11. Screenshots or Demo

- DEMO LINK - **LEARNHUB**

12. Known Issues:

- No real payment gateway (demo only)
- UI layout inconsistencies on some small screens
- Certificate print formatting varies by browser

13. Future Enhancements:

- Integrate real payment gateway (Stripe, Razorpay)
- Add notifications and messaging
- Implement advanced analytics for admins
- Add more media/content types (PDFs, quizzes)
- Improve accessibility and add mo’re automated test