Assignment-1

Online Learning platform prototype

1. Abstract

EduStream is a modern online learning platform designed to provide interactive and engaging online courses. The platform focuses on multimedia-rich course content, personalized learning experiences, secure authentication, and analytics-driven dashboards.

This report presents a functional **prototype** of EduStream, developed using **React** and **Tailwind CSS**, fulfilling four key requirements from the case study:

1. **Media Gallery & Playback Controls** – a responsive gallery for course materials.
2. **User Preferences & Dark Mode** – persistent theme toggle across sessions.
3. **Authentication & Secure Purchases** – signup form with real-time validation and a shopping cart.
4. **Dashboard & Analytics** – a simple dashboard displaying user progress and activities.

The prototype demonstrates how EduStream can deliver a scalable, secure, and user-friendly online learning experience while laying the groundwork for future integration with **Laravel + MongoDB backend**.

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2. Introduction

E-learning platforms are essential in the digital age, where learners demand flexibility, personalization, and interactive content. EduStream aims to solve this need by building a system that integrates multimedia learning with secure and seamless user experiences.

The prototype is not a fully deployed platform but a **proof-of-concept** covering the most critical features of EduStream. This document explains the system design, implementation, challenges, and future scalability considerations.

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3. Objectives

The goals of this prototype are:

- To allow users to **browse course content** via media galleries.
- To enable personalization with **dark mode preferences**.
- To provide a **signup form** with real-time feedback and a **shopping cart** for course purchases.
- To offer a **dashboard interface** for tracking progress.
- To build the frontend in a modular and scalable way using **React and Tailwind CSS**.

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4. System Architecture

4.1 Overall Architecture

- **Frontend**: React (component-based, state-driven UI).
- **Styling**: Tailwind CSS (utility-first design, responsive, dark mode support).
- **Routing**: React Router DOM (navigating between dashboard, signup, gallery, and cart).
- **Data Management**: Local state with React useState.
- **Backend (future)**: Laravel with MongoDB for persistence, APIs, authentication, and job queues.

4.2 Component Breakdown

- **Dashboard Page**: Displays user progress, enrolled courses, and statistics.
- **Signup Page**: Form with real-time validation for new users.
- **Media Gallery Page**: Video and audio lectures with playback controls.
- **Cart Page**: Add/remove courses, view total, proceed to checkout.
- **Navbar Component**: Navigation links + dark mode toggle.

4.3 Data Flow

- User actions (e.g., add course to cart) update local state.
- Components reactively update UI using React hooks.
- Future integration: Cart and Signup will sync with backend APIs.

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5. Implementation

5.1 Technologies Used

- **React** – dynamic UI, component reusability.
- **Tailwind CSS** – modern design, dark mode support, responsiveness.
- **React Router DOM** – page navigation.
- **JavaScript ES6** – event handling, state management.
- **HTML5 APIs** – form validation, media playback.

5.2 Core Features

(a) Media Gallery & Playback Controls

- Displays videos and audio lectures.
- Titles and resources are study-related (e.g., JavaScript Basics, Python Crash Course).
- Uses HTML5 <video> and <audio> elements with controls.
- Responsive grid layout via Tailwind.

(b) User Preferences & Dark Mode

- Dark mode toggle integrated in Navbar.
- Uses Tailwind's dark: classes and persists preference with localStorage.
- Applies globally across pages.

(c) Authentication & Secure Purchases

- **Signup Page**:
    - Real-time form validation using HTML5 constraint validation (required, pattern, etc.).
    - Error messages shown instantly for invalid inputs.
- **Shopping Cart**:
    - Add/remove courses dynamically.
    - Prevents duplicate entries.
    - Displays total price automatically using reduce().
    - Responsive two-column layout.

(d) Dashboard & Analytics

- Displays placeholder progress bars, enrolled courses, and recent activity.
- Built using Tailwind + Headless UI components.
- Prepares for integration with chart libraries (e.g., Recharts, Chart.js).

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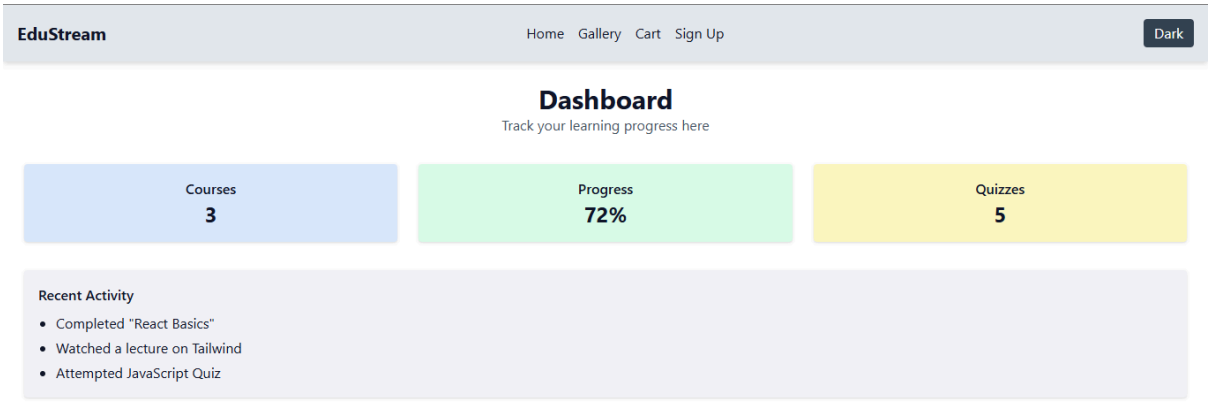
6. Results

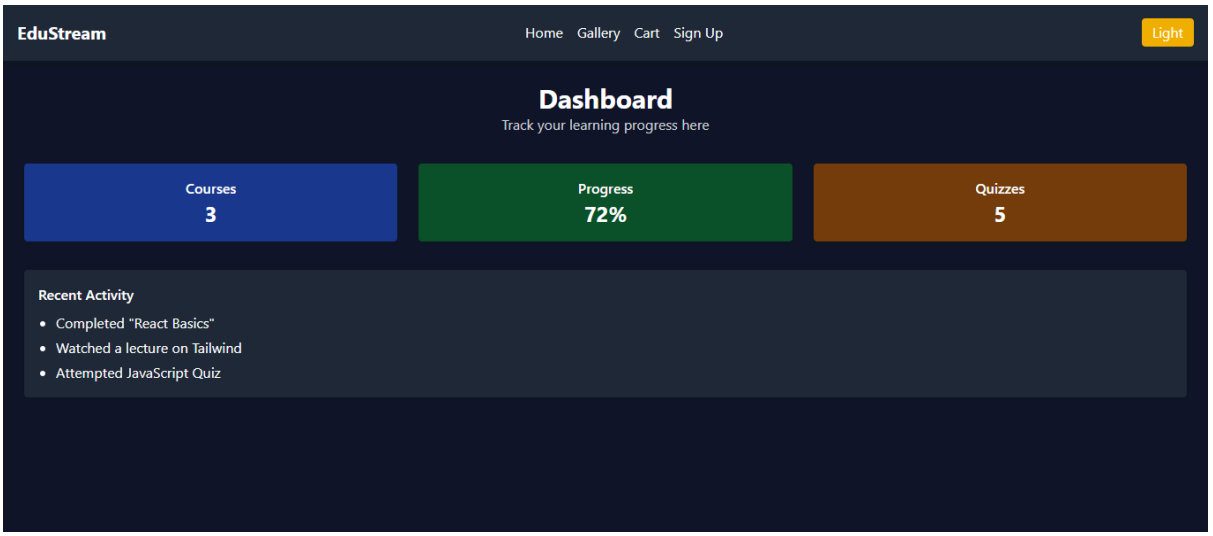
The prototype successfully demonstrates:

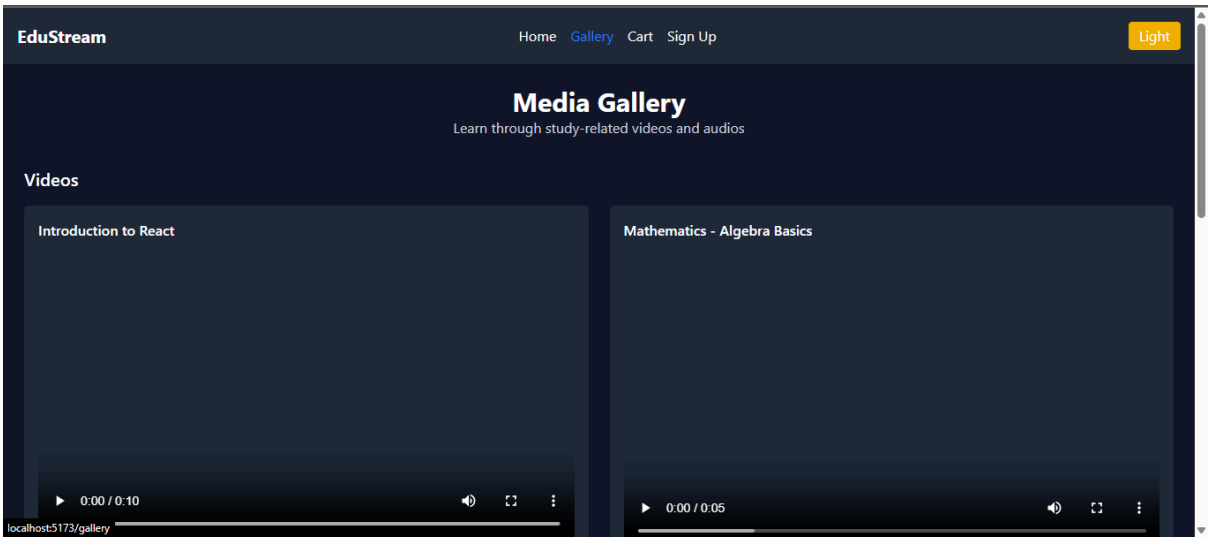
- A **modern UI** with dark/light mode.
- **Interactive media content** browsing.
- **Signup with validation** and **shopping cart management**.
- A **responsive dashboard** summarizing course progress.

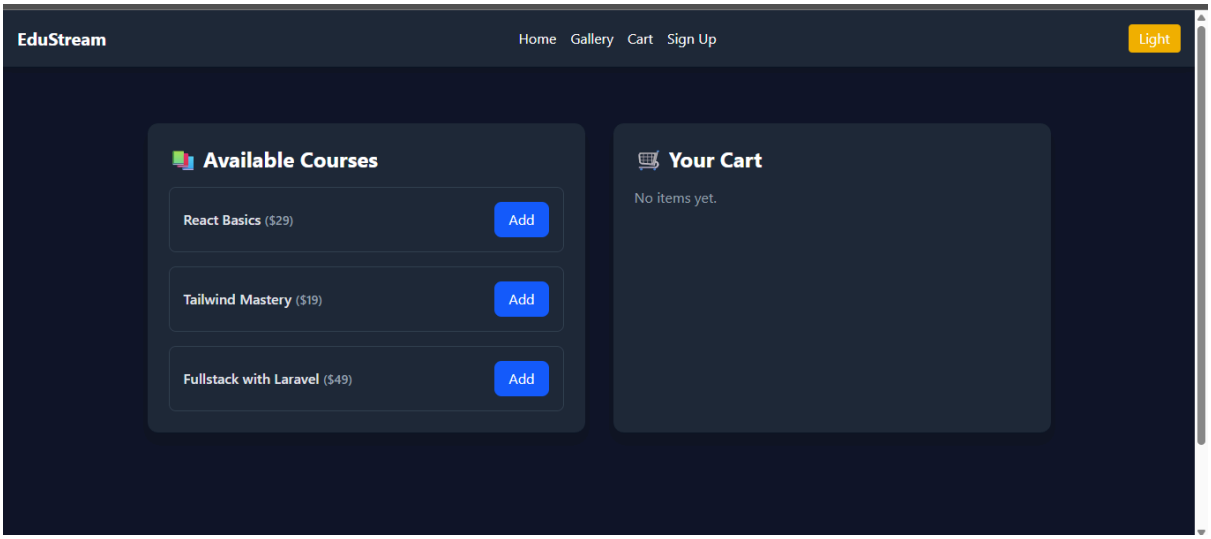
All features adapt well to different screen sizes, ensuring a smooth experience on both desktop and mobile devices.

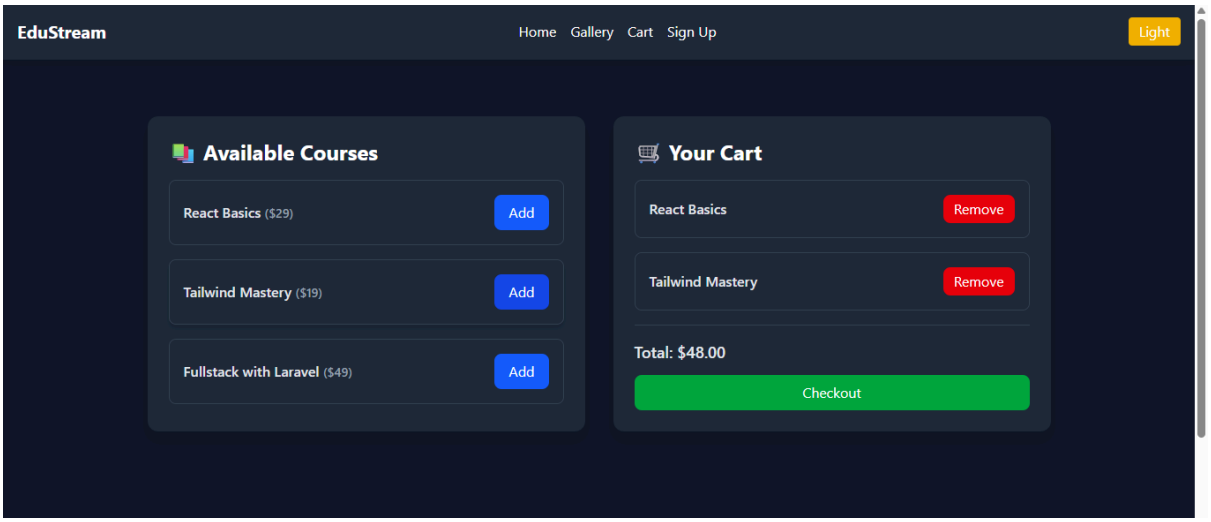
ScreenShots:








EduStream
Home Gallery Cart Sign Up
Light
Available Courses
React Basics ($29)
Add
Tailwind Mastery ($19)
Add
Fullstack with Laravel ($49)
Add
Your Cart
No items yet.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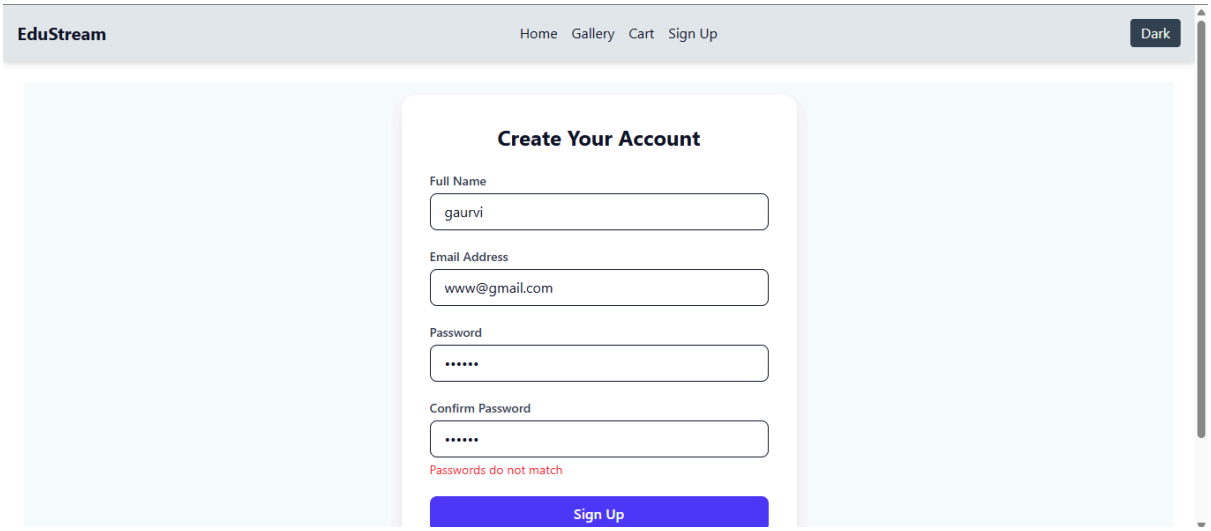
Your Cart
React Basics
Remove
Tailwind Mastery
Remove
Total: $48.00
Checkout


EduStream
Home Gallery Cart Sign Up
Dark
Create Your Account
Full Name
gaurvi
Email Address
www@gmail.com
Password
Confirm Password
Passwords do not match
Sign Up

7. Key Challenges

- **Dark Mode Persistence**: Ensuring theme preference is stored and reapplied.
- **Cart State Management**: Preventing duplicates and recalculating totals dynamically.
- **Responsiveness**: Designing layouts that work seamlessly across screen sizes.
- **Scalability Considerations**: Preparing components for future backend API integration.

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8. Security Considerations

- JWT-based authentication planned for production.
- Form validation prevents invalid user input.
- Future backend integration will include:
    - **Encrypted password storage**.
    - **Secure API endpoints** with token validation.
    - **Payment gateway** (e.g., Stripe) for safe transactions.

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9. Future Enhancements

- **Backend Integration**: Sync courses, users, and orders with Laravel + MongoDB.
- **Charts/Analytics**: Detailed graphs of user performance.
- **Payment Integration**: Stripe or PayPal for purchases.
- **Notifications**: Job queues for sending emails on course enrollment.
- **Advanced Personalization**: Recommended courses based on progress.

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10. Conclusion

The EduStream prototype demonstrates how a scalable and modern online learning platform can be built with React and Tailwind CSS. The implemented features (Media Gallery, Dark Mode, Signup with validation, Cart, and Dashboard) provide a strong foundation for further development.

By focusing on **scalability, modularity, and security**, this prototype proves that EduStream can evolve into a fully functional e-learning platform with backend integration, real-time analytics, and secure purchases.