TECHNICAL REPORT: CINEVERSE SYSTEM ARCHITECTURE AND CLOUD DEPLOYMENT

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Project Title: CineVerse: A Scalable Full-Stack Cinema Management System

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1. Introduction

CineVerse is a full-stack web application designed to streamline cinema operations, including movie scheduling, ticket bookings, and cafeteria management. The system is built using a decoupled architecture, ensuring high availability and scalability through Amazon Web Services (AWS).

2. System Architecture

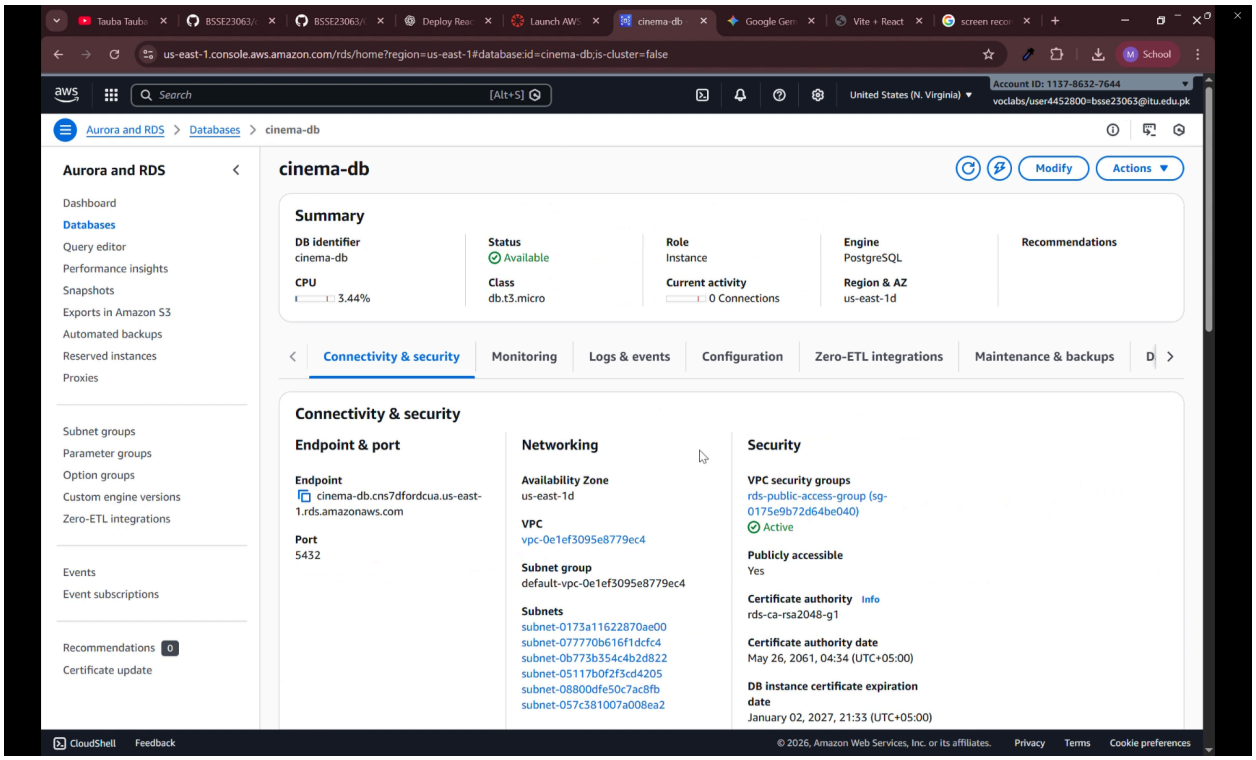
The project follows a **Three-Tier Architecture**:

1. **Presentation Tier:** Developed in React/Vite, hosted on Amazon S3.
2. **Logic Tier:** A Node.js/Express backend running on an Amazon EC2 instance.
3. **Data Tier:** A managed PostgreSQL database hosted on Amazon RDS.

3. Cloud Infrastructure & Deployment

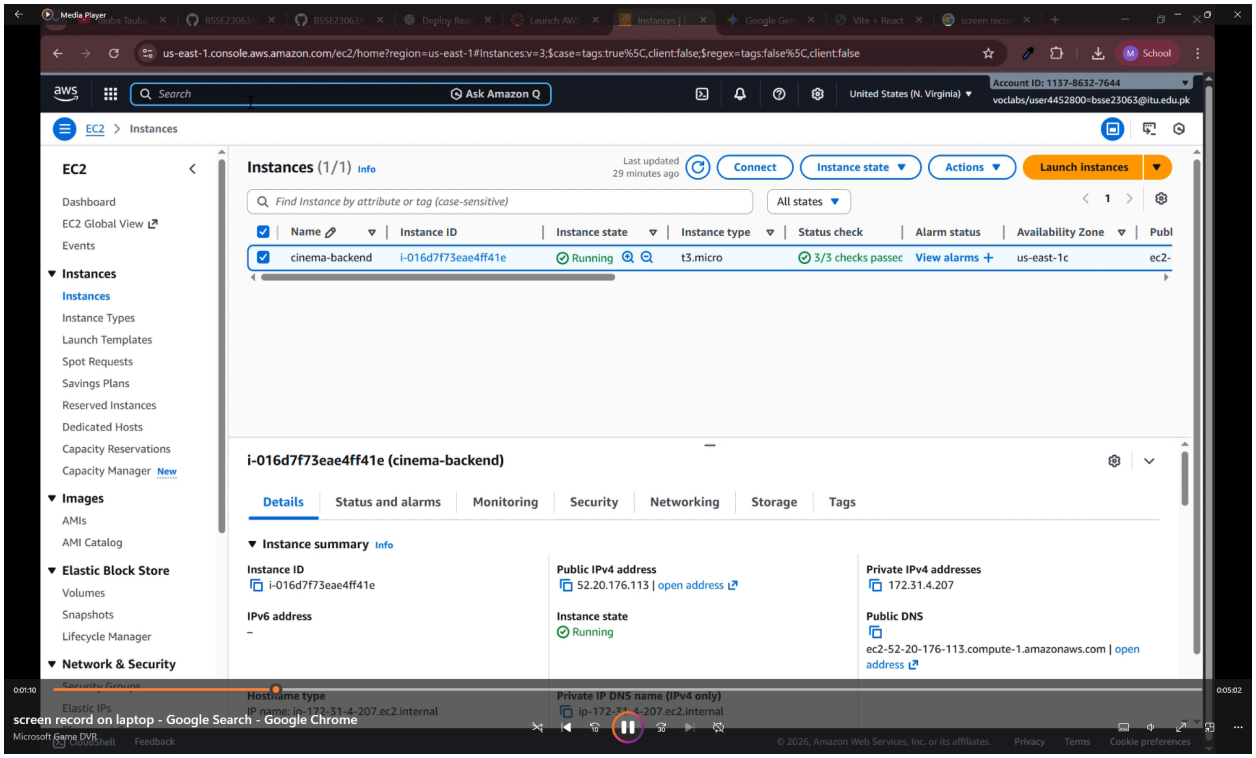
3.1. Database Layer (Amazon RDS)

The system utilizes **Amazon RDS (PostgreSQL)**. As shown in the configuration, the database is set to db.t3.micro to balance cost and performance.



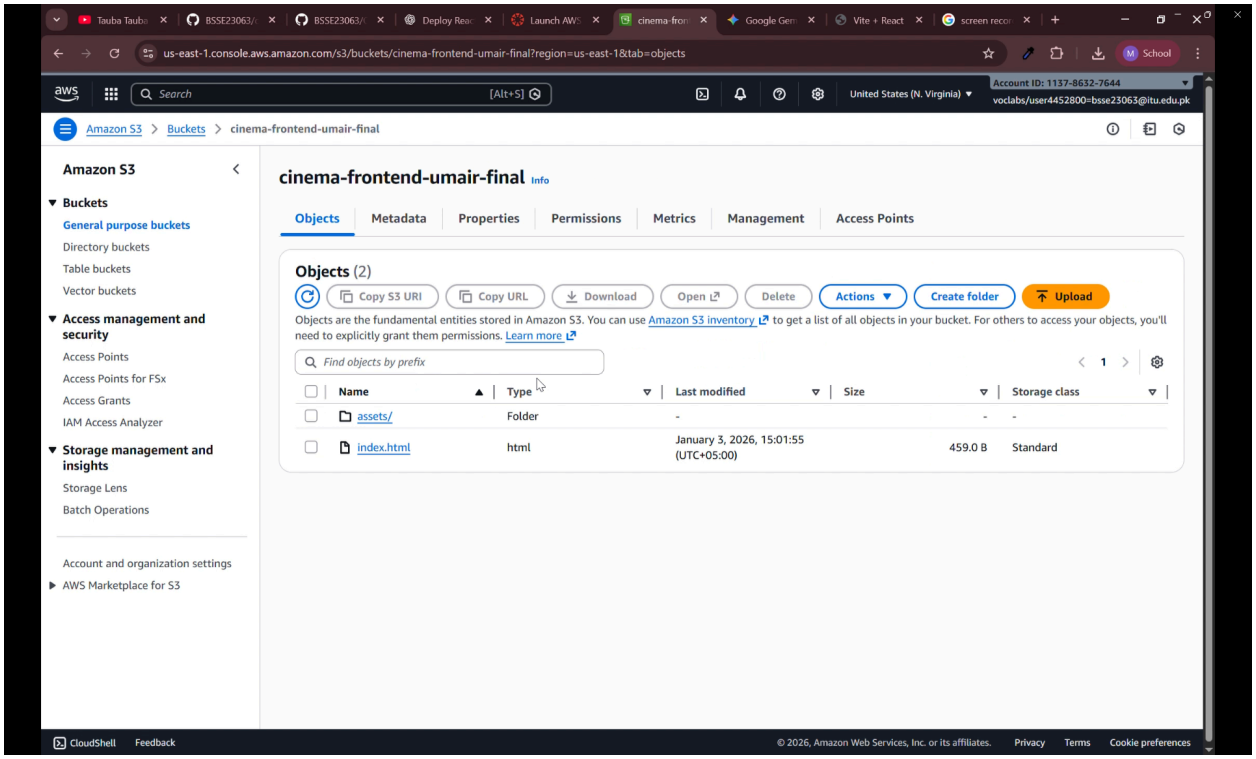
3.2. Backend Layer (Amazon EC2)

The backend services are deployed on an **EC2 T3.micro instance**. This instance handles API requests, business logic, and database queries.



3.3. Frontend Layer (Amazon S3)

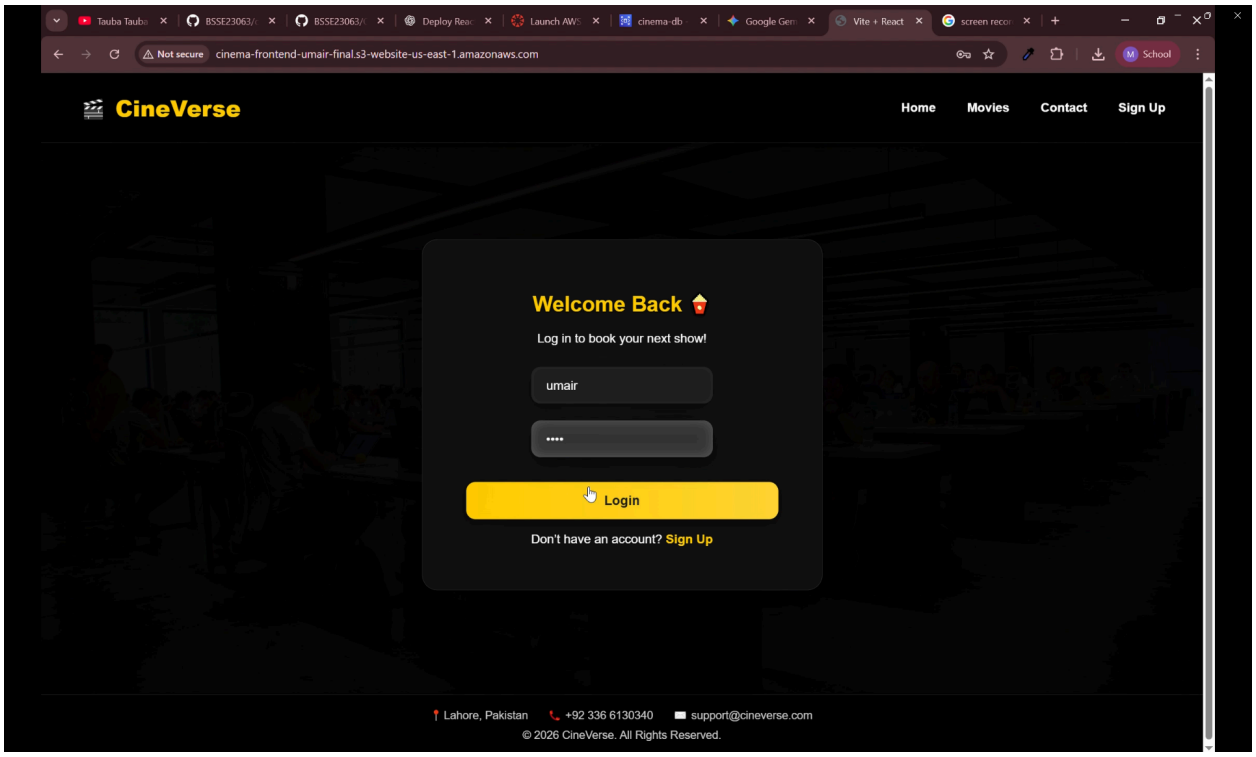
The React application is built and deployed as static files in an **S3 Bucket** configured for public website hosting.



4. Application Features & Interface

4.1. Authentication

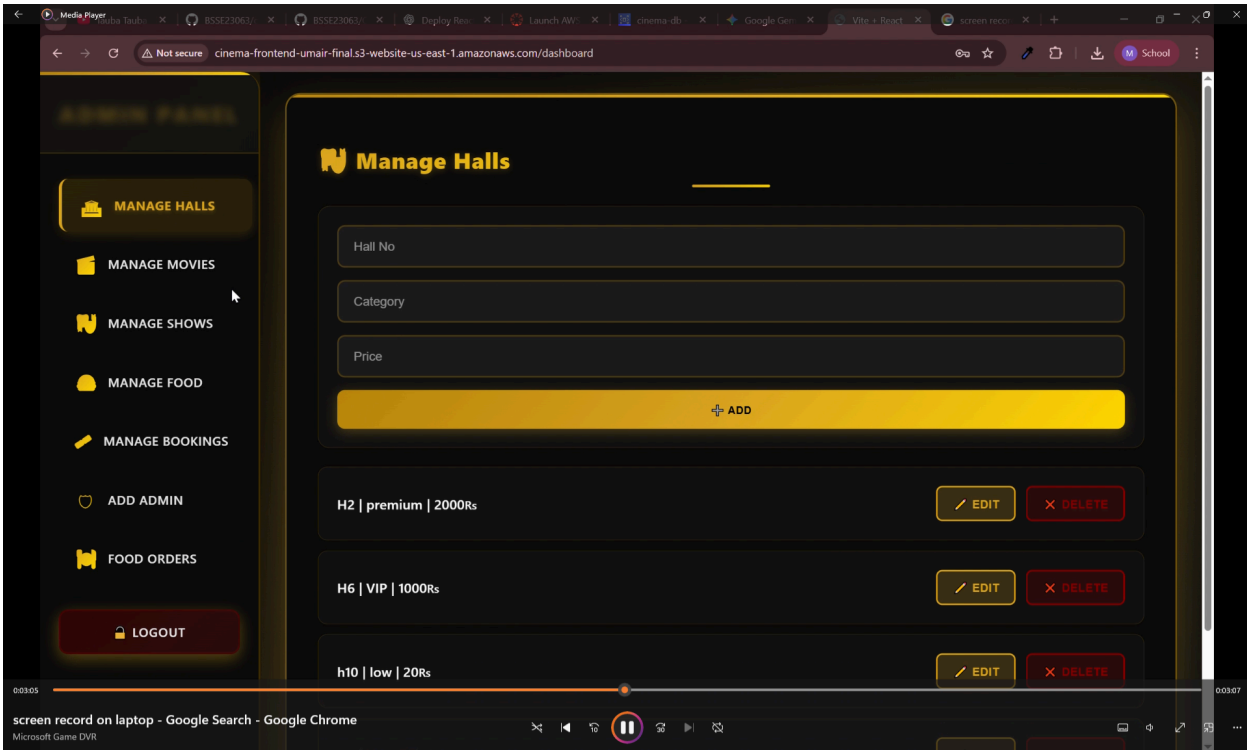
The entry point of the application is a secure login portal.



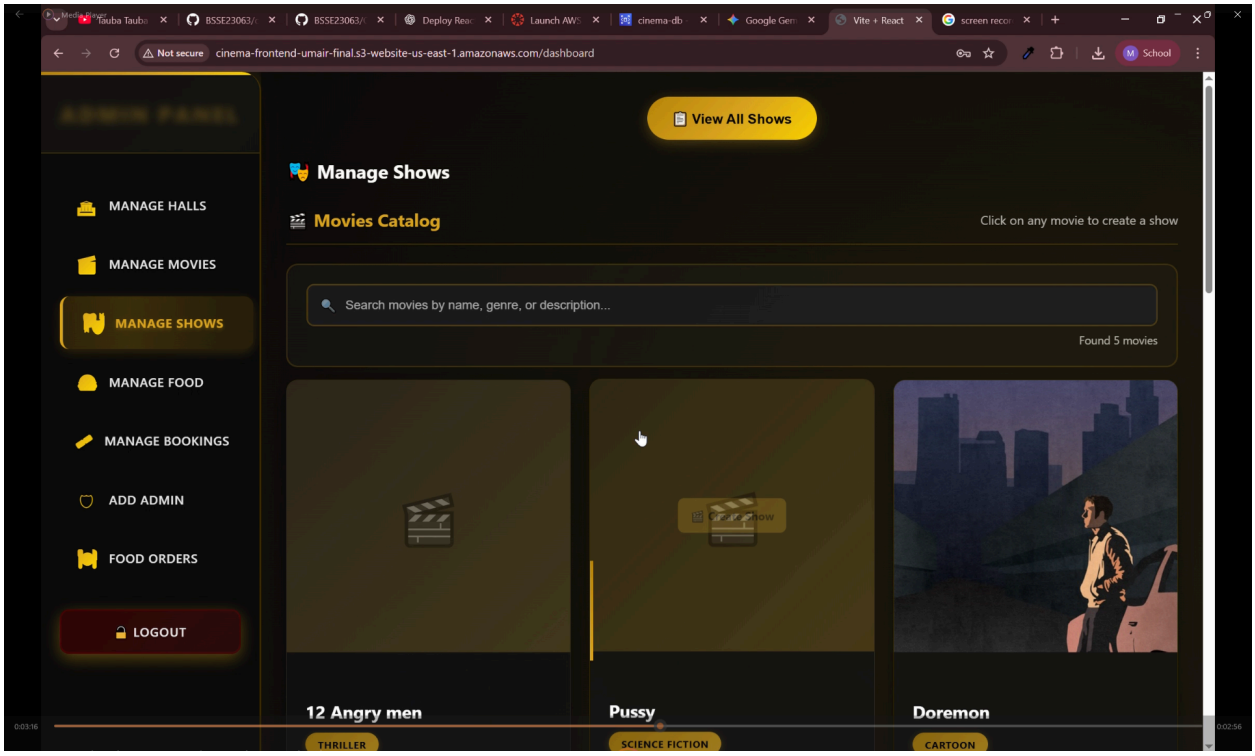
4.2. Administrative Operations

The Admin Panel allows for CRUD operations on cinema halls and shows.

- **Hall Management:** Defines hall categories (Premium/VIP) and pricing.



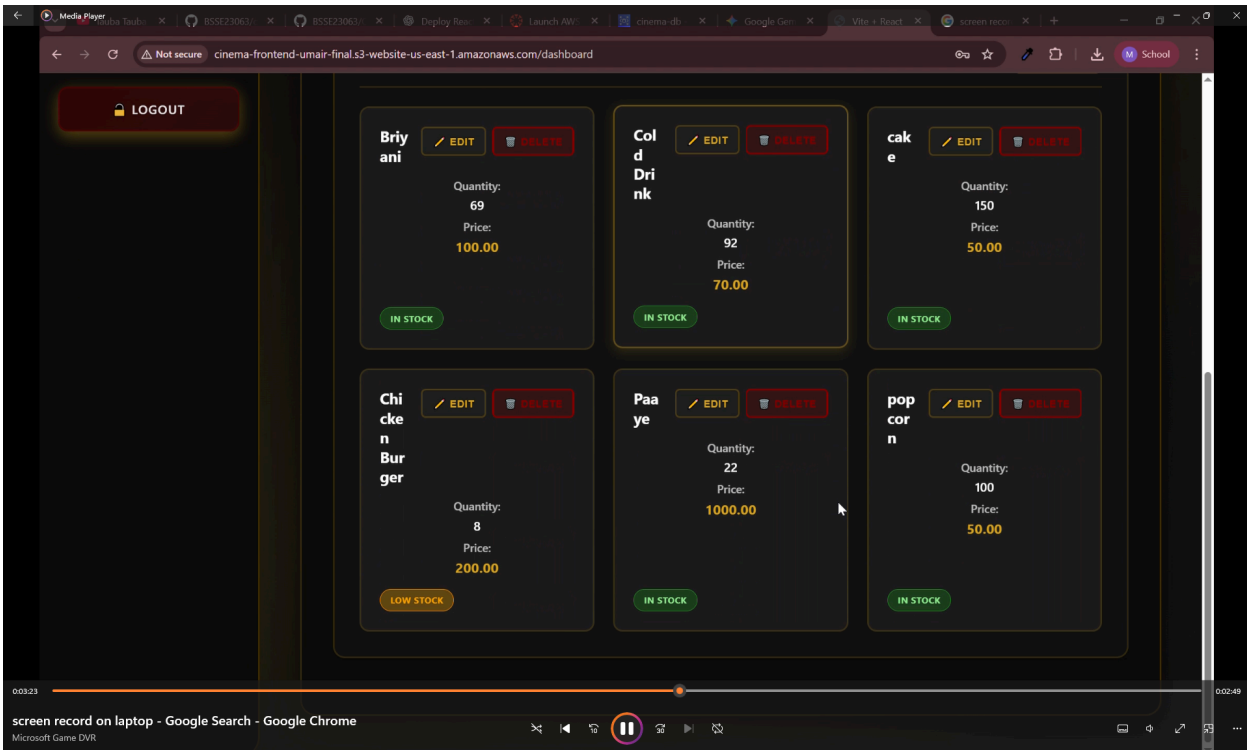
- **Show Scheduling:** Linking movies to specific halls and times.



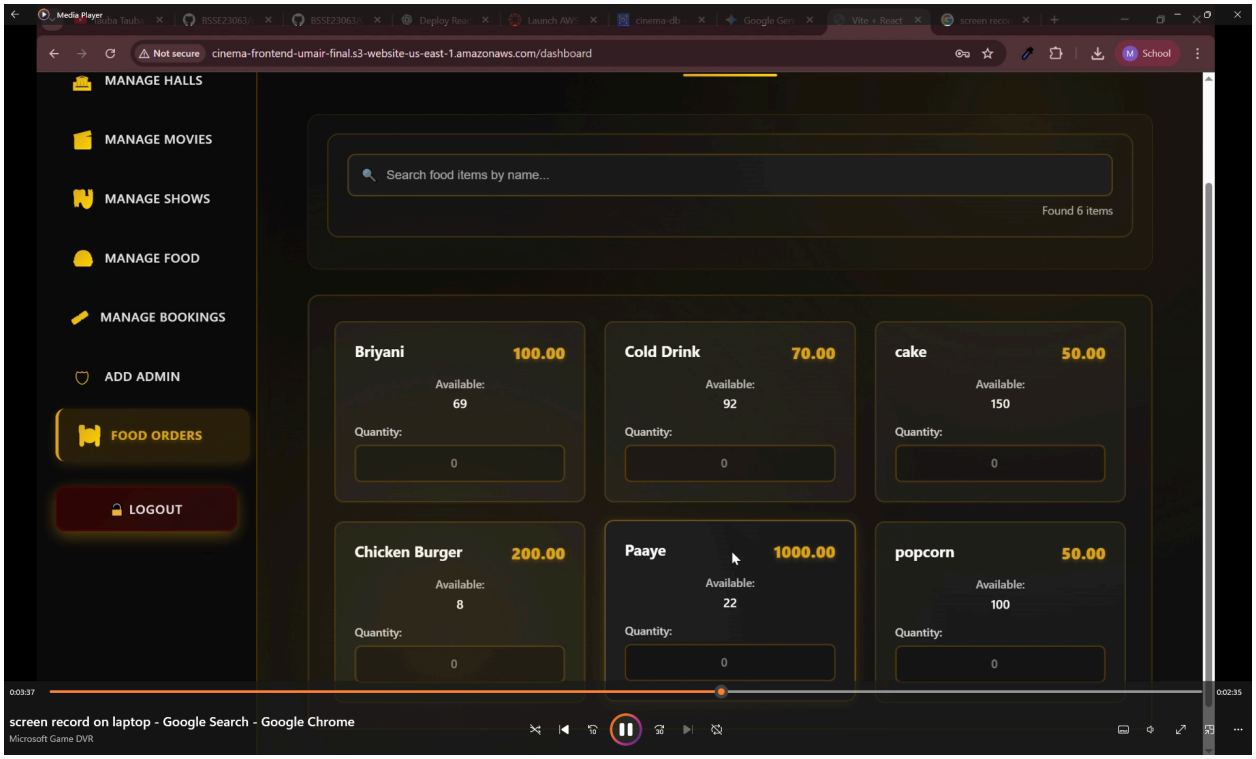
4.3. Inventory and Booking

A unique feature of CineVerse is the integrated food management system, which tracks stock levels in real-time.

- **Food Management:** Tracking price and availability (e.g., "In Stock" vs "Low Stock").



- **Customer View:** A user-friendly grid for ordering items like "Biryani" or "Cold Drinks."



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5. Conclusion

The CineVerse project successfully demonstrates the integration of modern web technologies with robust cloud infrastructure. By utilizing AWS RDS, EC2, and S3, the application achieves professional-grade deployment standards.

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6. REFERENCES (APA)

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