FULL STACK DEVELOPMENT WITH MERN PROJECT DOCUMENTATION

1. Introduction

Project Title : Flight finder -Navigating your Air Travel Option

Team id : LTVIP2025TMID55014

Team Members:

1. **Team Leader:**
   S Uday Sai Kumar – Full Stack Developer & Project Coordinator
   Responsible for overall planning, coordination, GitHub management, and integration of frontend and backend.
2. **Team Member**:

   Ravella Bhavani – Frontend Developer
   Works on the React-based UI, handles component design, page routing, and user interactions.

3. **Team Member**:

   Rehana Begum – Backend Developer
   Builds RESTful APIs using Node.js and Express.js, manages authentication and server logic.

4. **Team Member:**
   Rayavarapu Shiny – Database Administrator
   Designs and manages MongoDB schemas, handles CRUD operations and ensures data consistency.

2. Project Overview

- **Purpose:**
  To simplify flight booking and management by providing users with real-time availability, secure bookings, and user-friendly search features.
- **Features:**
  - Search and filter flights
  - Book tickets with user login
  - Admin panel for managing flights
  - Email confirmation and booking history

3. Architecture

- **Frontend:**
  Built with React.js using components, hooks, and React Router for navigation. UI powered by Material-UI.
- **Backend:**
  Developed using Node.js and Express.js. RESTful API handles all CRUD operations related to users, flights, and bookings.
- **Database:**
  MongoDB stores user data, flight details, and booking records. Mongoose is used for schema design and data validation.

➢ **Frontend (React.js)**

Components:

- SearchForm.js: Handles user inputs (source, destination, dates).
- FlightList.js: Displays ranked results from ML model.

State Management: Redux for shared state (user sessions, bookings).

➢ **Backend (Node.js/Express.js)**

API Routes:

javascript

```
app .get ('/api/flights', flightController  .search);

app.post('/api/bookings', authMiddleware , bookingController.create);
```

➢ **Middleware**: JWT validation, rate limiting.

Database (MongoDB)

Schemas:

javascript

```
const User = new Schema({
email: { type: String, unique: true },
 bookings: [{ type: Schema.Types.ObjectId, ref: 'Booking' }]
});
```

4. Setup Instructions

Prerequisites:

- Node.js >= 18
- MongoDB installed and running
- npm or yarn

Installation:

- git clone https://github.com/your-username/FlightFinder.git
- cd FlightFinder
- cd server
- npm install
- cd ../client
- npm install

Environment Variables:
Create a .env file in the /server folder with:

PORT=3000

MONGODB URI-
mongodb+srv://nehapriya:<db_password>@cluster0.zghkpqk.mongodb.net/?retryWrites=true&w=majority&appName=Cluster0

5. Folder Structure

- **Client:**

  /client

  ├── /src

  │ ├── /components

  │ ├── /pages

  │ ├── /api

  │ ├── App.js

  │ └── index.js

- Server:
  /server
  ├── /controllers

```
├── /routes
├── /models
├── server.js
└── .env
```

5.Running the Application

Frontend:

- cd client
- npm start

Backend:

- cd server
- npm start

7. API Documentation

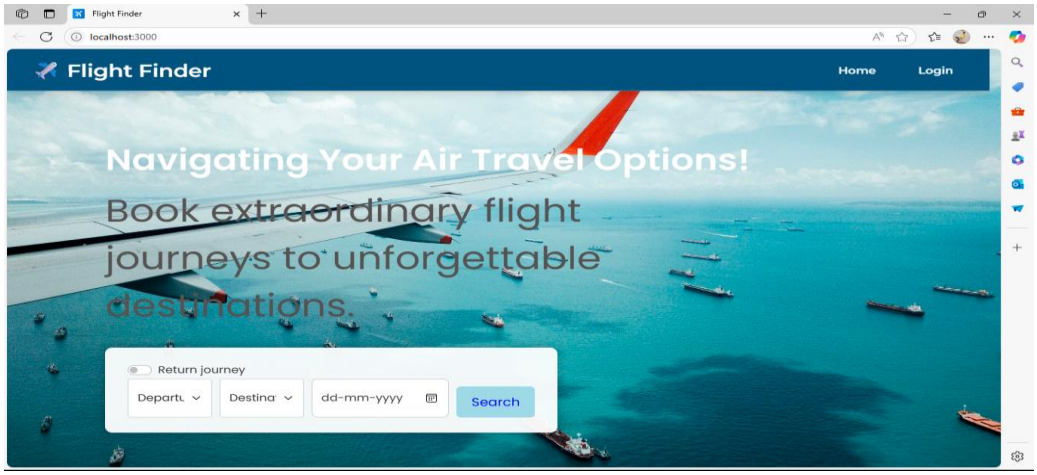
- **POST /api/auth/register**
  Registers a new user.
  Request Body: { name, email, password }
  Response: { success, token }
- **POST /api/auth/login**
  Logs in an existing user.
- **GET /api/flights**
  Retrieves list of available flights.
- **POST /api/bookings**
  Books a flight for the logged-in user.

8. Authentication

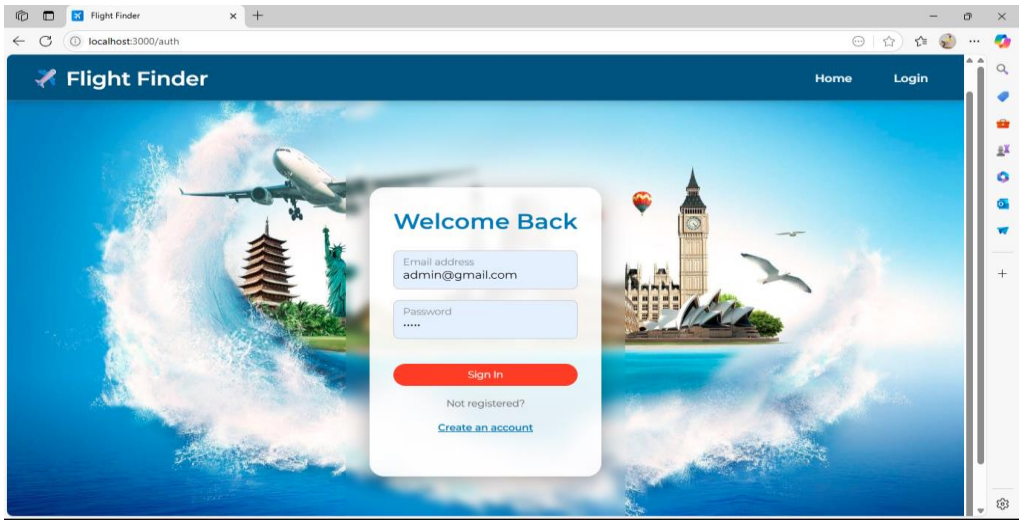
- Implemented using JWT (JSON Web Token).
- Tokens are stored in HTTP-only cookies.
- Protected routes validate tokens before granting access.

9. User Interface

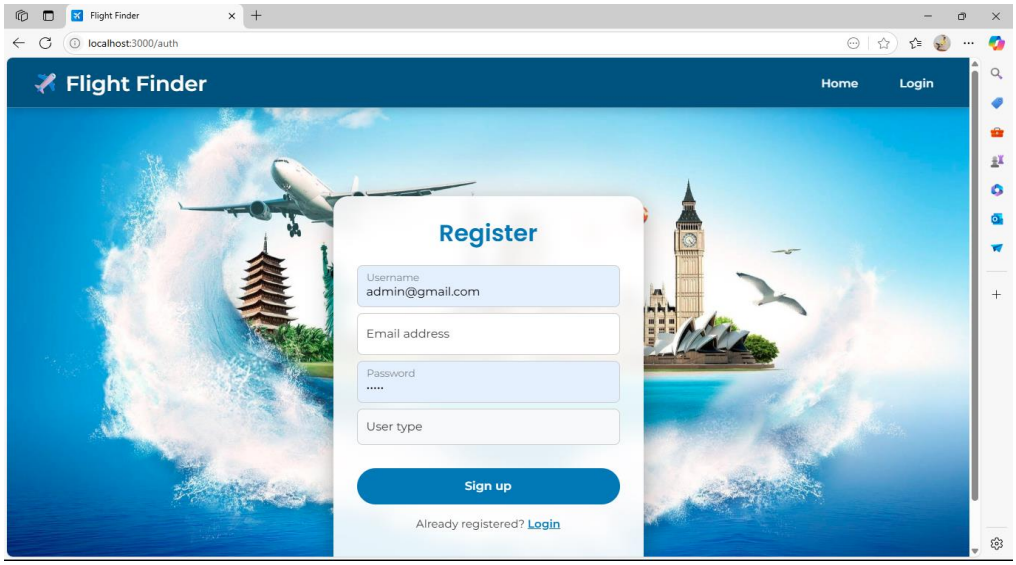
Home Page with flight search



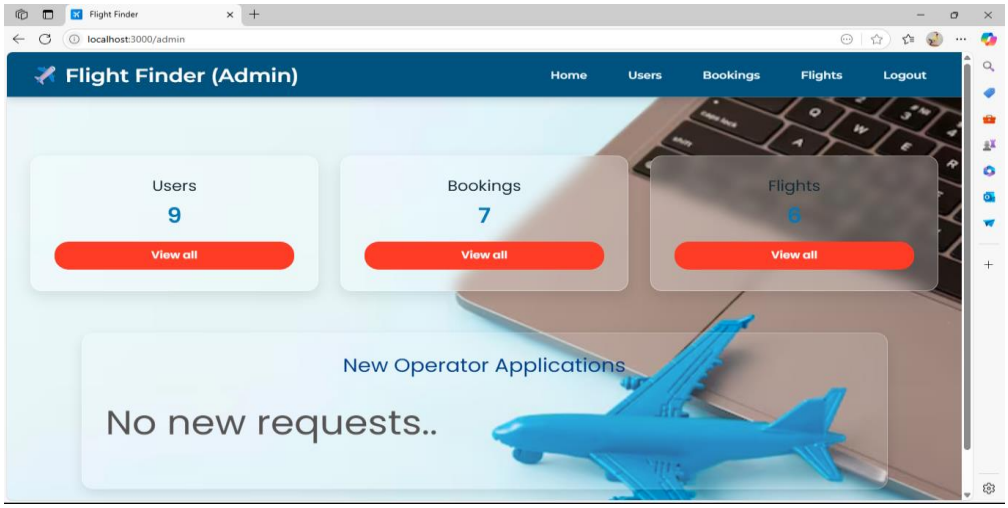
Login form



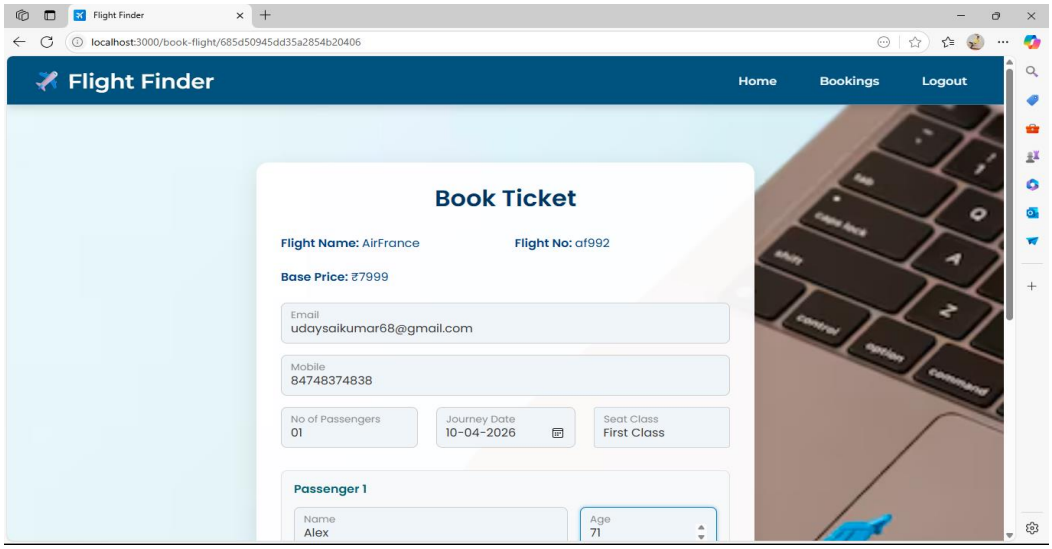
Register form

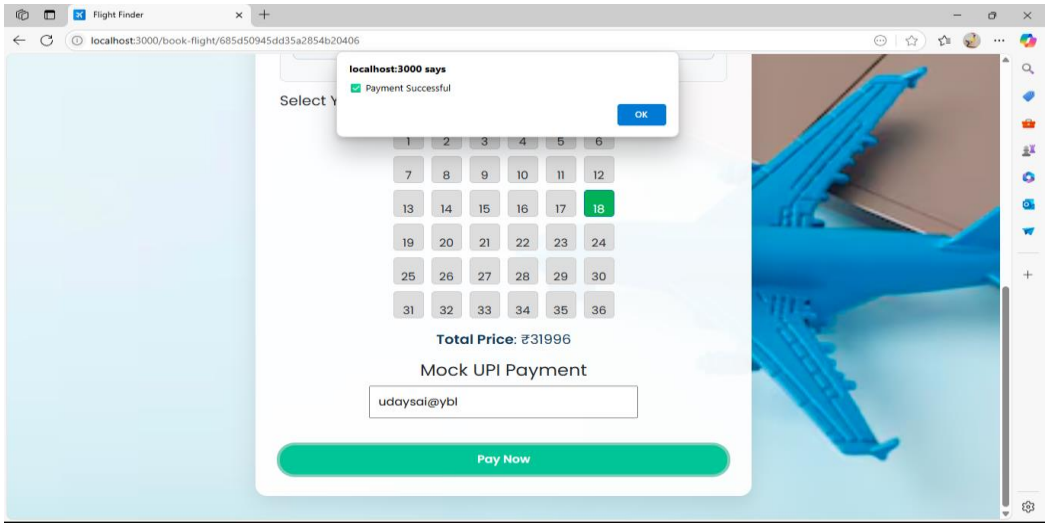


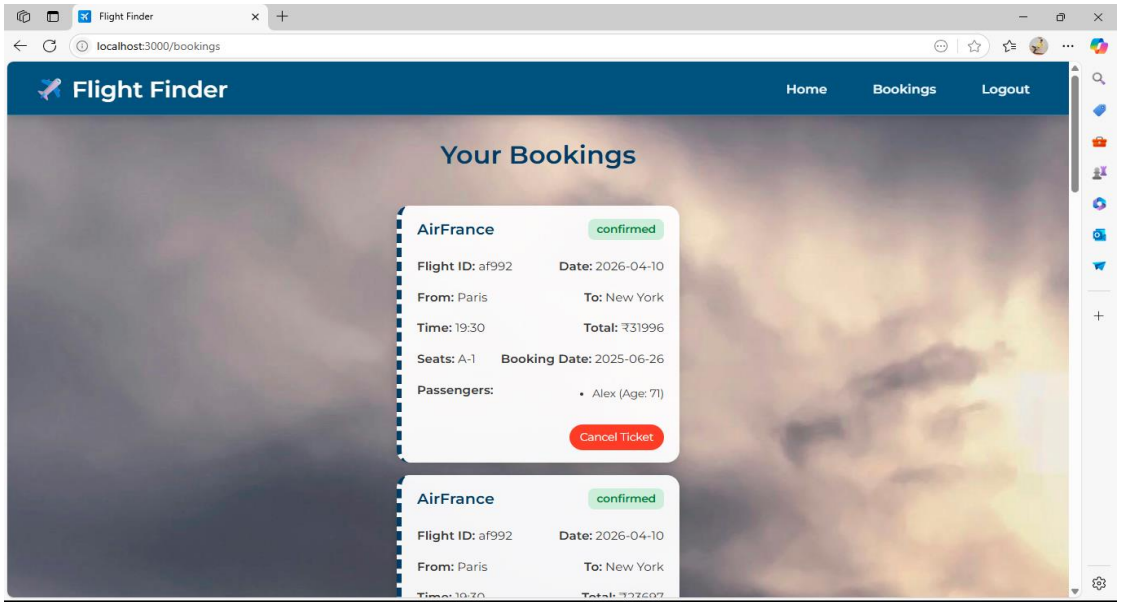
Admin dashboard



Booking confirmation page







10. Testing

- Manual testing on Postman for backend APIs
- Basic component tests in React using Jest and React Testing Library

11.Demo

Link:
https://drive.google.com/file/d/1scf_sNsChM5qGlqw0zi1TkogXLkXmb7e/view?usp=drive_link

12. Known Issues

- No password recovery implemented yet
- UI responsiveness needs improvement on tablets

13. Future Enhancements

- Payment integration with Razorpay/Stripe
- Role-based admin access
- Real-time flight tracking integration