FULL STACK DEVELOPMENT WITH MERN PROJECT DOCUMENTATION

1. Introduction

Project Title : Flight finder -Navigating your Air Travel Option

Team id : LTVIP2025TMID59024

Team Members:

1. **Team Leader:**
   K Thirumalesh– Full Stack Developer C Project Coordinator
   Responsible for overall planning, coordination, GitHub management, and integration of frontend and backend.
2. **Team Member**:
   JAYASREE FANI PRIYA TATA– Frontend Developer
   Works on the React-based UI, handles component design, page routing, and user interactions.
3. **Team Member**:
   JARAPALA RAJA NAYAK– Backend Developer
   Builds RESTful APIs using Node.js and Express.js, manages authentication and server logic.
4. **Team Member:**
   Jarugu Venkata Yaswanth – 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=trueCw=majorityCappName=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

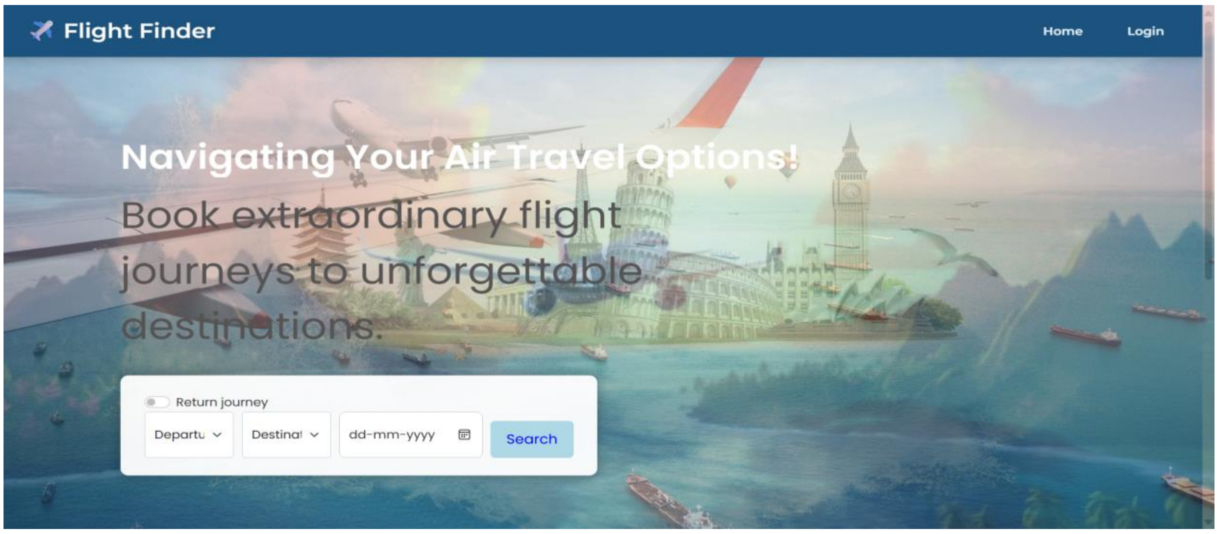
- **POST /api/auth/register**
  Registers a new user.
  Request Body: { name, email, password }
  Response: { success, token }
- **POST /api/auth/login**
  Logs in an existing user.
- **GET /api/flights**
  Retrieves list of available flights.
- **POST /api/bookings**
  Books a flight for the logged-in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

8. Authentication

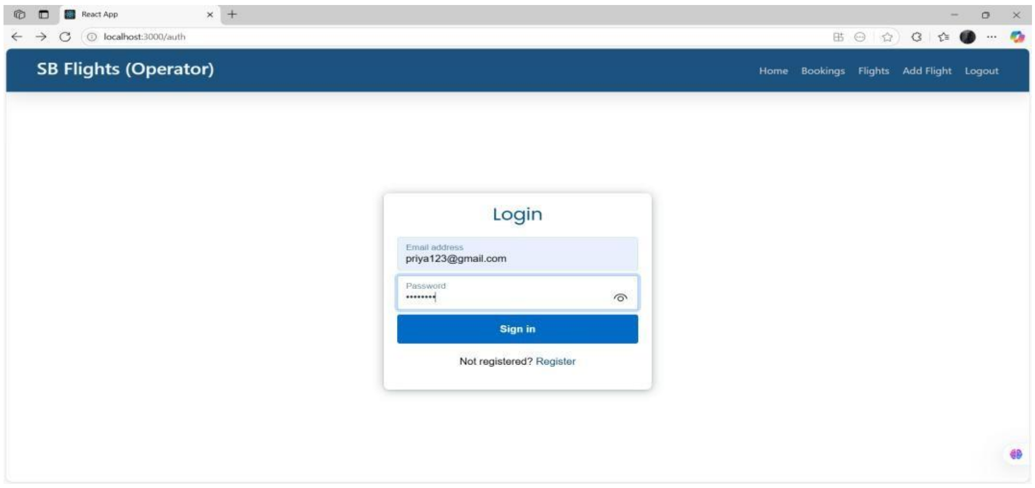
- Implemented using JWT (JSON Web Token).
- Tokens are stored in HTTP-only cookies.
- Protected routes validate tokens before granting access.

9. User Interface

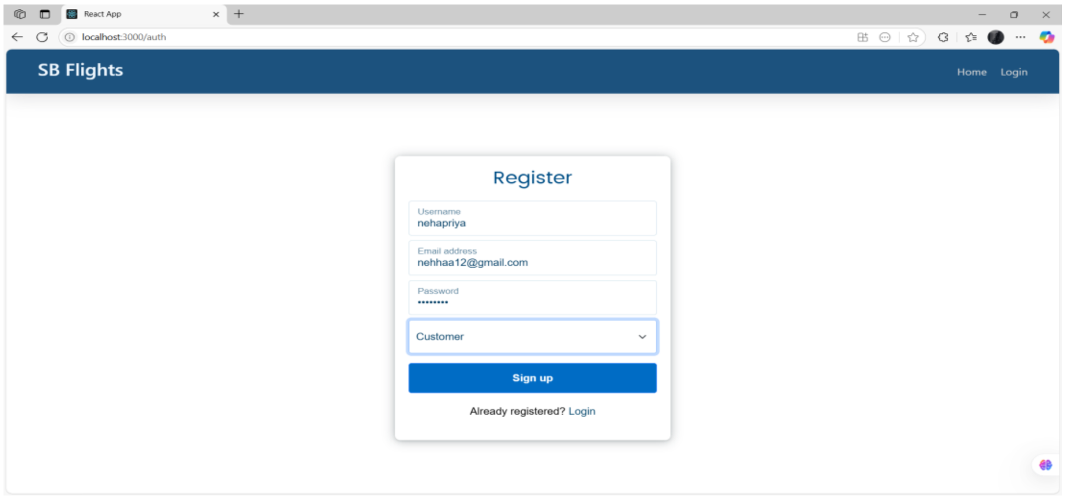
Home Page with flight search


Flight Finder
Home
Login
Navigating Your Air Travel Options!
Book extraordinary flight journeys to unforgettable destinations.
Return journey
Departu
Destinat
dd-mm-yyyy
Search

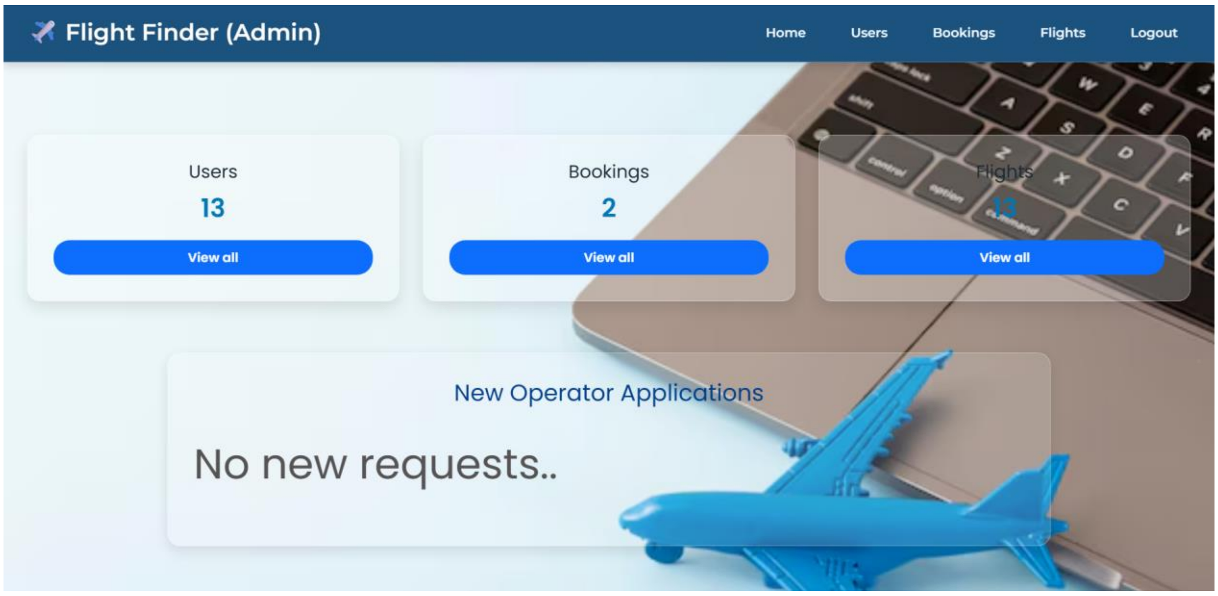
Login form



Register form



Admin dashboard



Users
13

Bookings
2

Flights
13

New Operator Applications

No new requests..

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/1pC1eQYezBeBYpmnp9M-4fjWzxmS1ZNfF/view?usp=sharing

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