# INSTITUTE OF AERONAUTICAL ENGINEERING
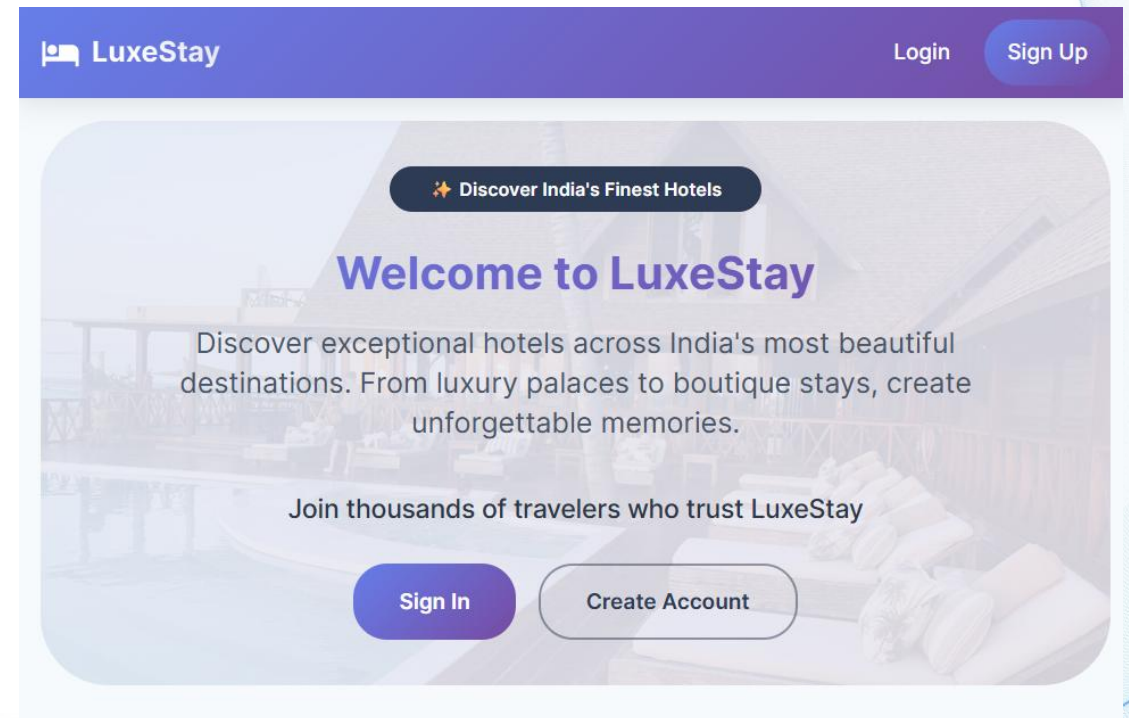## Dundigal,Hyderabad-500 043, TELANGANA, INDIA.

CSE(DATA-SCIENCE)

JAVA FULL STACK DEVELOPMENT
COURSE CODE – ACSD30

# TITLE - HOTEL ROOM BOOKING SYSTEM

Paluvai Sai Karthik – 23951A67C8
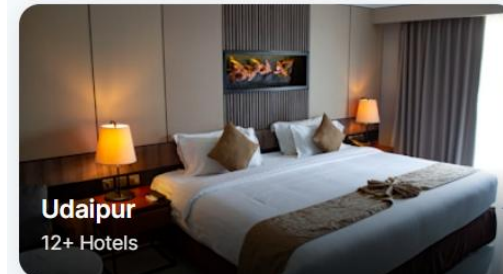Sandhiri Sai Abhinav – 23951A67C2

# Introduction

- The **AI-Powered Hotel Booking System** is a **full-stack web application** designed to simplify hotel search, booking, and management.

- It leverages **AI technology** to enhance user experience through intelligent recommendations and chatbot support.

- Built with **Spring Boot (backend)** and **React (frontend)**, it ensures scalability, speed, and security.

- The system supports **real-time updates** for availability and booking confirmations.

# Objectives

- Deliver a **user-friendly booking interface** with advanced search options.

- Empower hotel administrators with **centralized management tools**.

- Integrate **AI-based assistance** for instant customer help and feedback.

- Ensure **real-time synchronization** of room availability and prices.

- Implement **robust authentication, data protection**, and **role-based access**.

# System Architecture

Frontend (React) ↔ REST API ↔ Backend (Spring Boot) ↔ Database (MySQL/PostgreSQL)
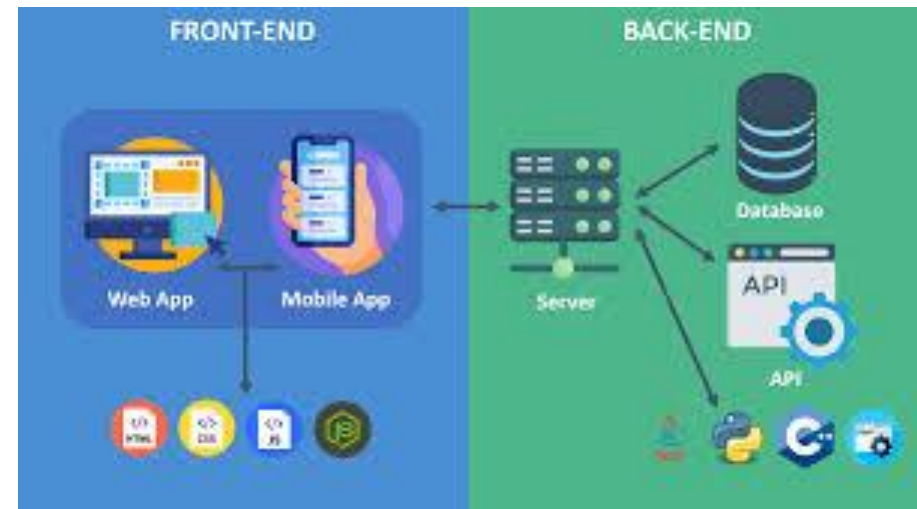
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Google Gemini AI API

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WebSocket for Real-Time Updates



**Layers Explanation:**

**Frontend:** Handles user interface and client-side logic.

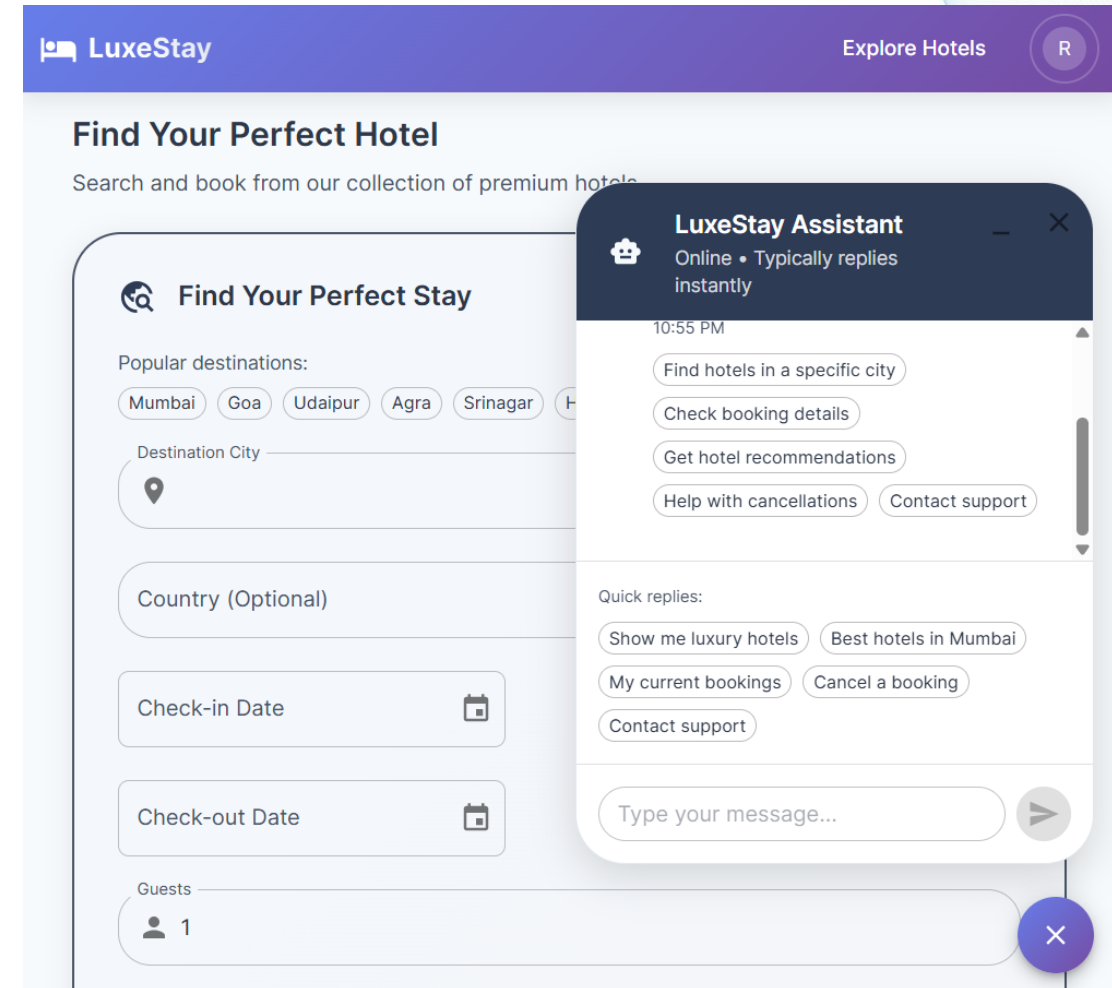**Backend:** Manages business logic and API services.

**Database:** Stores user, hotel, and booking data.

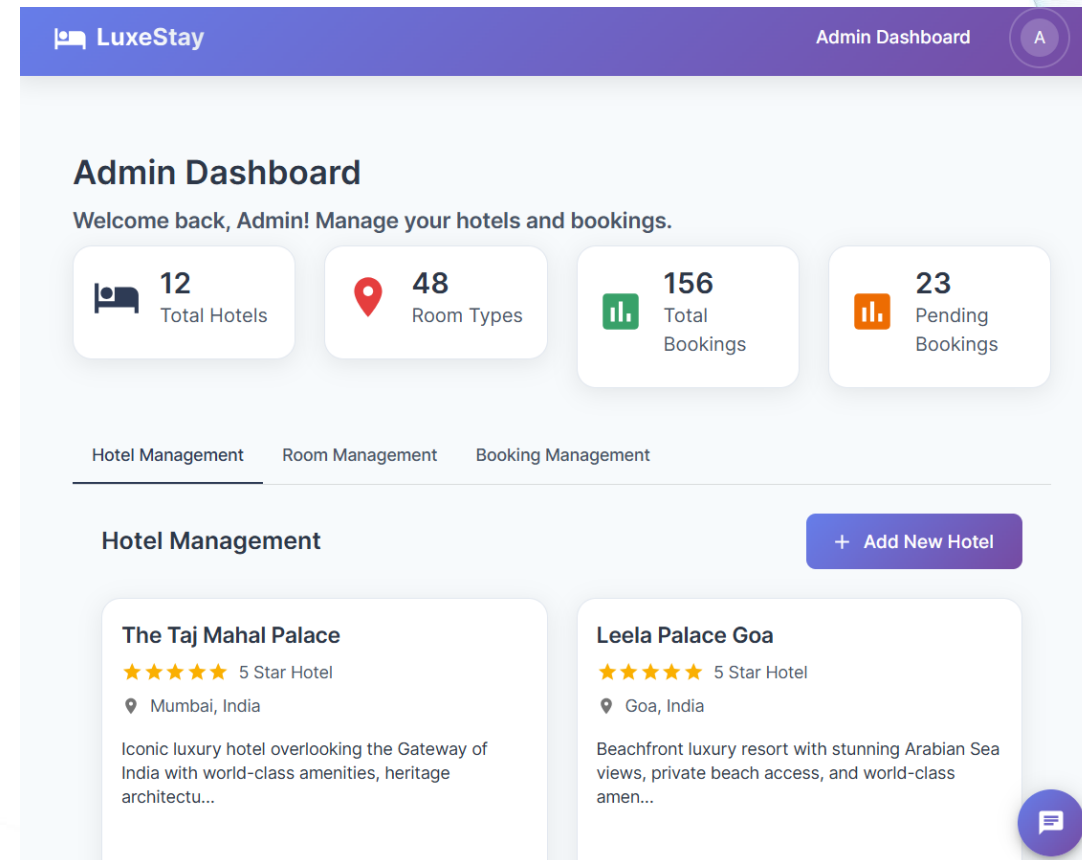**AI Layer:** Provides chatbot and smart recommendations.

# User Features

- **User Registration & Login:** Secure JWT authentication.

- **Hotel Discovery:** Filter hotels by location, price, rating, and amenities.

- **Instant Booking:** View real-time room availability and book instantly.

- **Booking History:** Access past and upcoming reservations anytime.

- **Profile Management:** Update personal details and preferences.

- **AI Chatbot Support:** 24/7 assistant that answers queries and guides users.

# Admin Features

- **Hotel Management:** Add, edit, and delete hotel listings with images and details.

- **Room Management:** Configure room categories, pricing, and capacity.

- **Booking Oversight:** Monitor all ongoing and completed reservations.

- **User Control:** Manage customer accounts and permissions.

- **Dashboard Analytics:** Visual insights into bookings, occupancy, and revenue trends.

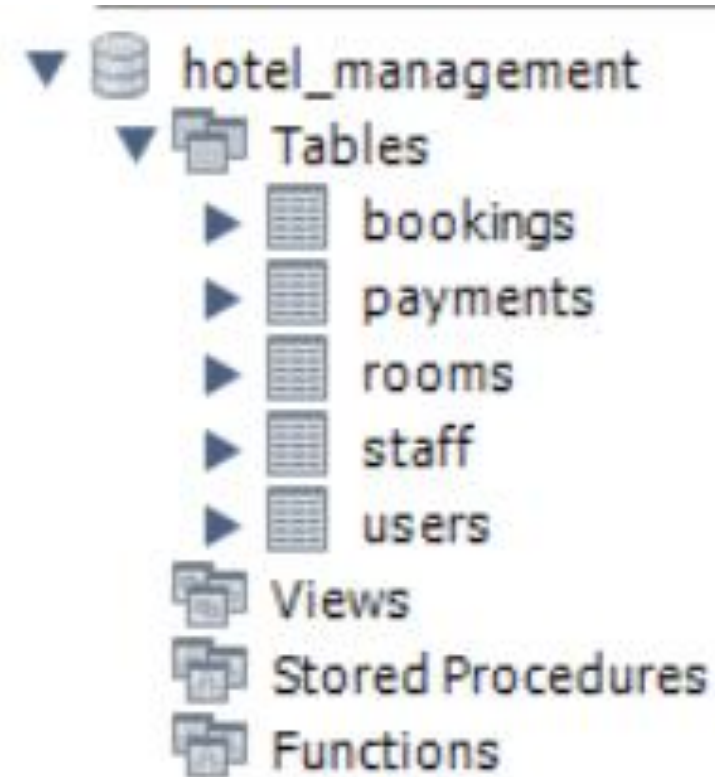- **Real-Time Sync:** Immediate updates reflected across the system for all users.

# Technology Stack

- **Frontend:** React 18, Redux Toolkit, React Router, Axios, CSS3

- **Backend:** Spring Boot 3.x, Spring Data JPA, Spring Security + JWT

- **Database:** MySQL (main) / H2 (development testing)

- **AI Integration:** Google Gemini API (Chatbot & NLP)

- **Real-Time Communication:** WebSocket

- **Build Tool:** Maven

# Security & Database Design

•**JWT Tokens** for authentication

•**Role-Based Access Control** for Admin & Customer

•**BCrypt Password Encryption** for safe credentials

•**Input Validation & SQL Injection Prevention**

•**CORS Policy** for controlled frontend-backend communication
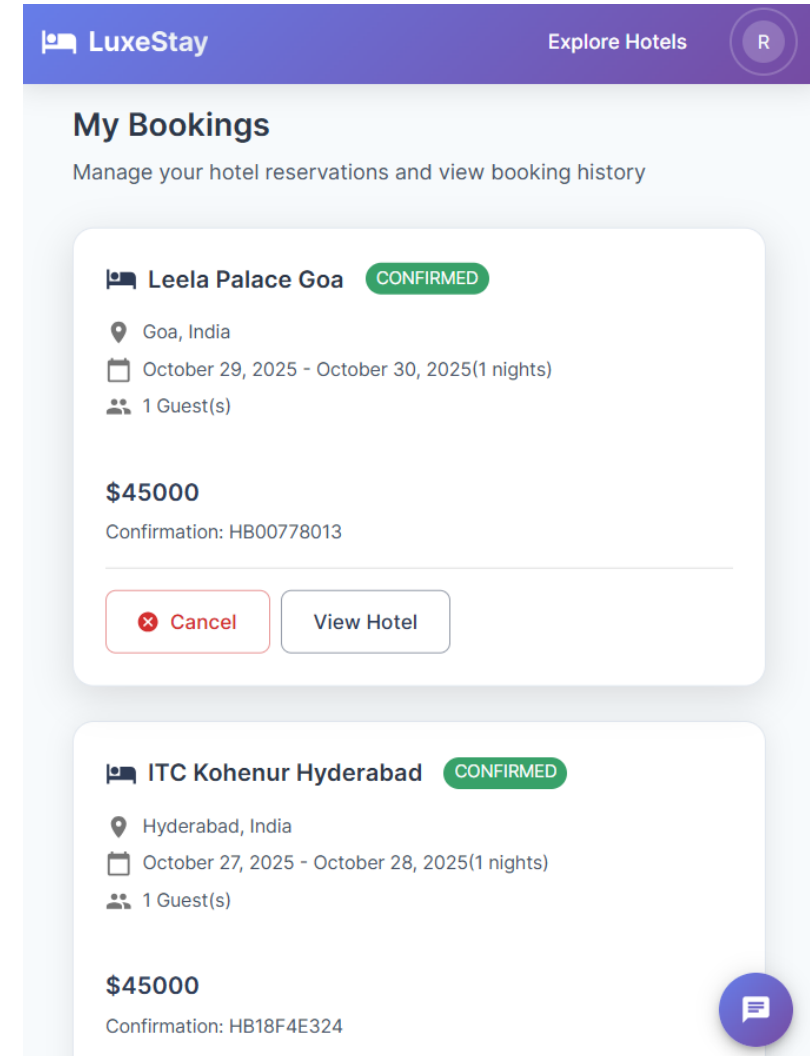
# Project Highlights & Future Scope

**Project Highlights:**

- Full-Stack Integration (React + Spring Boot)

- Real-Time Functionality with WebSocket

- AI Chatbot powered by Google Gemini

- Enterprise Security using JWT and BCrypt

- Responsive, modern UI/UX design

**Future Enhancements:**

- 🌐 Online Deployment on AWS or Render

- 💳 Payment Gateway Integration (Stripe/PayPal)

- 📱 Mobile App Development (Android/iOS)

- 🌍 Multi-language Support

- 🎁 Loyalty Program & Smart Recommendations

# Conclusion

- The **AI-Powered Hotel Booking System** offers a smart, secure, and efficient booking experience.

- Combines **React**, **Spring Boot**, and **AI integration** for modern, real-time functionality.

- Ensures **scalability, data security, and user convenience**.

- Currently in the **development phase** with core features tested locally.

- Lays the foundation for a **future-ready, intelligent hotel management platform**.

# Thank You