

## Project Report

### Author

Name: DHANIYALA VENKATA SATHVIK

Roll Number: 24F1001404

Student Email: 24F1001404@ds.study.iitm.ac.in

### Description

This project aims to develop a smart parking management system that helps users locate and reserve parking spots. It includes features like spot availability tracking, quick booking, and release time cost calculation. AI is used to rectify the error in flask routing and Styling i.e 28%.

### Technologies Used

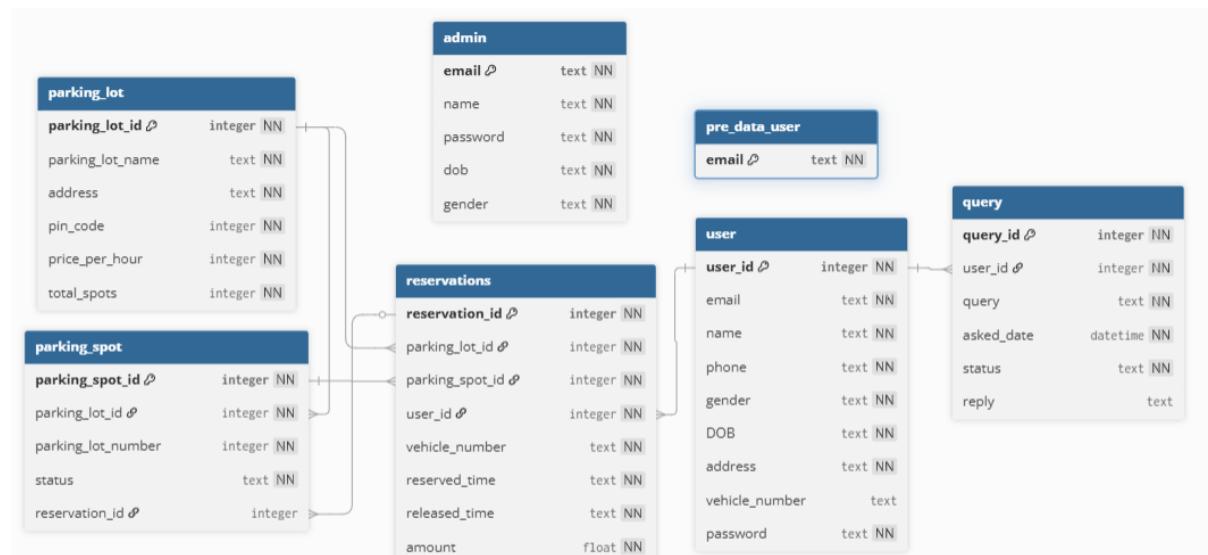
- Python 3: Core programming language for backend logic
- Flask: Lightweight web framework
- Flask-SQLAlchemy: Object Relational Mapper (ORM) for managing the database
- SQLite: Local lightweight database
- HTML/CSS/Bootstrap: For frontend structure and responsive UI
- Jinja2: Template rendering engine

### Purpose of Frameworks/Libraries

Flask offers simplicity and flexibility for rapid development. Flask-SQLAlchemy manages database operations with ease and safety. SQLite is ideal for projects requiring simple, local data storage. Bootstrap + Jinja2 provide a modern and dynamic user interface.

### Database Schema Design

User Table, Parking Lot Table, Parking Spot Table, Reservation Table , query table with respective fields and constraints.



## API Design and Routing

**Auth:** / , /login , /signup

**User:** /user/home, /user/profile , user/editProfile

**Booking:** /user/book , /reserve-spot , /Release

**Admin:** /admin/home , /admin/users, /admin/view-profile , /admin/edit-profile

**Lot Management:** /admin/add-parking-lot, /admin/edit-lot, admin /delete\_lot/

**Spot Management:** /admin/view-spot , /admin/delete-spot , /admin/occupied-spot-details

**Queries:** /contact\_us , /admin/query

## Architecture and Features

### Project Structure

```
/project-root/
├── app.py          # app starting point
├── models/         # Database file (SQLite)
│   ├── user.py     # user.py for user table
│   └── ...
├── templates/      # HTML templates
│   ├── index.html
│   └── ...
├── static/          # CSS , Images
└── controllers     # handles rooting and other data operations
```

### Core Features

- Admin dashboard for managing parking lots, slots, users, and bookings
- User dashboard for viewing and booking slots.
- Quick Booking feature
- Validation for double bookings and active lot deletion
- Flash messages and Queries for feedback
- Responsive design using Bootstrap

### Extra Features

- - Role-based access control
- - Booking fee calculation with hourly rate
- - Booking statistics, revenue tracking

## Video

<https://drive.google.com/file/d/1oI3By4nIj4PJUE05ocv62WKViF7ThJ-d/view?usp=sharing>