

Student Details

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Project Details

Title: ParkEase

Description:

The Vehicle Parking App is a modern web application designed to manage multiple parking lots, parking spots, and vehicle reservations. It supports a multi-user environment with distinct roles, including an Admin with root access and general users who can reserve parking spots. The application provides functionalities for administrators to manage parking lots and spaces effectively, while users can easily book, occupy, and release parking spots, view reservation histories, and receive automated notifications and reports.

Technologies Used

- **Frontend:** VueJS, Bootstrap
- **Backend:** Flask, SQLAlchemy
- **Database:** SQLite
- **Task Queue:** Celery with Redis
- **Caching:** Redis
- **Authentication:** JWT

Project Structure

```
parkease/
├── backend/
│   ├── app.py
│   ├── config.py
│   ├── models.py
│   ├── routes.py
│   ├── tasks.py
│   ├── celery_app.py
│   ├── admin_routes.py
│   ├── user_routes.py
│   ├── cache.py
│   ├── celery_worker.py
│   ├── celery_beat.py
│   ├── db.py
│   ├── requirements.txt
│   ├── parkease.db
│   └── venv/
└── frontend/
    ├── node_modules/
    ├── public/
    ├── src/
    │   ├── components/
    │   ├── views/
    │   ├── store/
    │   ├── router/
    │   └── services/
    ├── .eslintrc.js
    ├── .gitignore
    ├── .prettierrc
    ├── babel.config.js
    ├── jsconfig.json
    ├── package-lock.json
    ├── package.json
    ├── README.md
    └── vue.config.js
```

ER Diagram



API Endpoints

- **User Authentication:** /api/auth/register, /api/auth/login
- **Parking Lot Management (Admin):** /api/admin/parking-lots, /api/admin/parking-lots/<id>
- **Parking Spot Management:** /api/admin/parking-lots/<lot_id>/spots
- **Reservation Handling:** /api/users/reservations, /api/users/reservations/<id>
- **User Reservation History:** /api/users/reservations/history
- **Admin Analytics:** /api/admin/analytics

Key Features

- **Role-based Access Control:** Distinct interfaces for Admins and Users.
- **Automatic Spot Allocation:** Efficient allocation of parking spots upon user booking.
- **Reservation Tracking:** Detailed logs of parking reservations and history.
- **Analytics and Reporting:** Integrated charts for visualization using Chart.js.
- **Automated Notifications:** Daily reminders and monthly reports via email.
- **Async Jobs:** CSV exports managed asynchronously through Celery and Redis.

Presentation Video

<https://drive.google.com/file/d/1jNXOcOrjMdPU0Ffgu9Uny0UTib5Ay9NC/view?usp=sharing>

AI Usage Declaration

No AI/LLM tools were utilized in the development of this application.