

Author

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I am passionate about developing web applications that serve real purpose.

Description

Creating a user interface to login and register for users to be able to book their nearest parking slots, calculate the timestamp and accumulate the cost. Admin has many options to make lots, modify them, see user statistics and search for details of spots, revenue. Used AI for the basic layout and terminology to start the complex section such as plotting graphs and search design. (10% backend logic, 10% html + jinja2)

Technologies used

Flask + SQLAlchemy

For accessing the database from SQLite.

Datetime

For calculating the time of the car at the parking slot.

Matplotlib

For creating interactive graphes to represent the slots, revenue, total cost.

Numpy

Connection between the data handling and graphs.

OS

For saving of png image files.

SQLite viewer/explorer

Used for establishing databases.

DB Schema Design

The database is divided into user, parking_lot, parking_slot and reservation.

Contains general info about the user like email and password and make sure to take the pincode to determine the lots available at the same pincode.

Parking Lot contains the max slots of the lot and the address with pincode.

Parking Slot is the subset of Lot that includes more if it is available or not.

Reservation used to store the vehicle number and timestamp of the vehicle in a slot.

API Design

I have not used any API services that were integrated during the development.

Architecture and Features

Firstly the sections of login and register for registering to the parking application. It collects all the information of users which includes name, address, pincode, phone number, and creating password for login.

Then comes the user_dashboard section that starts off with the main page itself for using it as a search query for location and pincode. Then displaying the user's reservation options and history too.

For book-spot the user can book the selected lot and select the vehicle number and slot for reserving.

For releasing the spot the, timestamp and the fees are calculated upon this controller

User_summary for showing the total fees up-to the date with the bar graph.

Separate section to edit the details of the user with all the attributes given at the registration.

Now coming to the admin_dashboard to show the lots and availability of spots or not and updates upon changes.

From the /new-lot we could be able to add the lots into the database by adding pincode, name and address.

Using of /delete-lot and /delete-slot with the option of not deleting the slot if it is occupied.

If occupied then details are provided via /occupied_details

Importantly users accessibility to the admin and search feature to be able to search the given attribute and then listing the data.

Finally, for showing the summary of the slots occupied totally and revenue from each lot through the /admin_summary route.

Further improvements can be plugged in like addition of maps api through OpenStreetMaps for determining the exact position of the slot visually.

More implemendations such as showing the route to the slot from faraway as well as inside the lot, as repeated symbols and lot could be confusing to find the vehicle.

Video

https://drive.google.com/file/d/1W-wkKxCKvWHg-3DXttCpiYG_-sHnEnOp/view?usp=drive_link