Group 3: Auto Park
Contributions Breakdown:

We do not have integration testing in our project because we are just planning on having a website that both customers and management can access from any browser. The points from this section should be redistributed to the code section. We have not implemented any data_collection section. This will be implemented later so garage management can view their garage's data and later manually change garage settings.

Equal Contribution Sections:

- Demo Slides
- Reports

Chunhua Deng

- Literature review (50%)
    - Search the state-of-the-art dynamic parking systems
- Profit optimization based on demand function (30%)
- Email notification module
- ExitGate module
- FlatRate module
- Calculate the price based demand function with multiple model.
- Calculate the time based demand function by regression on the real data.
- Data visualization
- Data fitting algorithm
- Data cleaning:
    - Using statistic method to process the raw data.
    - Analyze the result and delete the abnormal data point.

Corey Chen

- Registration Module (logic and database queries: 60%)
- Interactions between pages on the site (Registration, Login, Reservation)
- Login Module (Debugging and Testing Edge Cases: 20%)
- Front end (formatting the website: 50%)
- Database Management
- Database Table Organization and Configuration
- Organizing meetings/ other logistics

Jonathan Garner

- SMS Notification Module
- Authentication Code Module
- Brochure (50%)
- Garage Logic (Debugging/Testing)

Ridhima Sakhuja

- Registration Module (logic and input validation) (40%)
- Interaction between login/registration pages
- Login Module (20%)
- Brochure(50%)

Siddharth Musale

- Entrance Gate Module
- Elevator Module
- Spot Verification Module
- Traffic Management Module
- Login Module (80%)
- All html view pages
- Page routing on web application
- Login and Reservation Logic
- Exit Gate, Billing, and Notification Module Integration
- Database Creation, Configuration, and Management

Siyu Liao

- Literature Review (25%)
- Data Retrieval Module
    - Retrieve parking data periodically (there is a limit on retrieval amount)
- Data Consolidation Module
    - Merge data pieces into a large csv file
- Data Cleaning Module
    - Filter out unreasonable data records like excessive durations
- Data Processing Module
    - Use Spark for querying large parking data (5.32GB, 62,327,971 parking records)
- Data visualization
    - Use pandas for visualizing the query results
- Calculate the time based demand function by regression on the real data.
- Calculate the price based demand function with multiple model.
- Profit optimization based on the demand function. (30%)

Xianglong Feng

- Literature Review (25%)
    - Search the state-of-the-art dynamic pricing system research work.
- Parking data preprocessing.
    - Reformat the parking data for daily, weekly, monthly and a year.
- Data cleaning:
    - Using statistic method to process the raw data.

    - Analyze the result and delete the abnormal data point.
- Calculate the time based demand function by regression on the real data. (70%)
    - Estimate the fitting model base on the real data.
    - Using logic regression to tune the coefficient of the fitting model
- Calculate the price based demand function with multiple model.
    - Estimate the price based demand model base on other research result.
    - Propose multiple demand model for different scenario.
- Data visualization.
    - Visualize the raw data and check the fitting curve.
- Profit optimization based on the demand function. (40%)
    - Solving the optimization by using gradent-decent.
- Demand model for incident event.