LO1 Functional and Non Functional equirements

Non-functional Requirements

Security and Privacy: The system must ensure the security and privacy of user data, including personal information and payment details, by implementing robust encryption methods and secure data storage practices.

Performance: The system should be capable of handling a high volume of orders efficiently, with minimal latency and response times, to provide a seamless user experience. It must have low downtime and high reliability to ensure continuous operation during peak hours and critical periods.

Scalability: The system should be scalable to accommodate increases in user demand and order volume without sacrificing performance or user experience.

Availability: The system must be highly available, ensuring uninterrupted service delivery to users, with minimal downtime for maintenance or system upgrades.

Response Time: The system should have fast response times for order processing, navigation planning, and drone deployment to meet user expectations for timely deliveries.

Accuracy: The system's navigational algorithms and pathfinding mechanisms must be accurate and precise, ensuring that drones follow optimal routes and deliver orders to the correct locations.

Environmental Impact: The system should aim to minimize its environmental footprint by optimizing drone routes to reduce energy consumption and greenhouse gas emissions.
Noise pollution should be minimized by scheduling drone flights during non-peak hours and avoiding densely populated areas.

Compliance: The system must comply with regulatory requirements and industry standards related to drone operations, data protection, and food delivery services.

Usability: The system should provide clear and informative feedback to users, such as order confirmation messages and estimated delivery times.

Maintainability: The system should be designed with modularity and maintainability in mind, making it easy to update, troubleshoot, and enhance functionality as needed. It should have comprehensive logging and monitoring capabilities to facilitate system maintenance and performance analysis.

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Functional Requirements

The system is responsible for processing orders from restaurants and delivering them to Appleton Tower. It must validate orders to ensure they meet specified criteria, classifying them as valid or invalid based on conditions such as correct card details, order contents, and total price calculation. Valid orders require the calculation of the Euclidean distance from Appleton Tower to the restaurant. Cards are accepted only after the Luhn test. For drone navigation, the system must be capable of flying the drone in 16 compass directions. During order collection or delivery, the drone should hover above Appleton Tower or the restaurant and the system needs to determine the nodes necessary for the shortest path from Appleton Tower to the restaurant. The system is tasked with writing three files labeled with dates in the YYYY-MM-dd format. The deliveries.json file contains details of orders for the day, including delivery status and attributes. The geojson file records the drone's moves for visualization purposes with the flight path information.