Interview Project Assignment
Live Order Tracking System

Business Context

A logistics company manages deliveries for multiple merchants. Operations teams need to track orders as they move through different stages and see updates instantly as drivers or internal systems report changes. The company also requires historical traceability for issue investigation and reporting purposes.

Objective

Design and implement a system that fulfills the functional and non-functional requirements described below. The focus is on correctness, clarity, and system behavior rather than specific technologies.

Requirements

1. Order Creation

- Allow new orders to be created.
- Each order must include a unique identifier.
- Customer details (minimum: name and contact reference).
- Merchant reference (identifier or name).
- Current status (e.g., created, picked_up, in_transit, delivered, cancelled).
- Created timestamp and last-updated timestamp.

2. Order Status Updates

- Allow existing orders to have their status updated.
- Store the new status, timestamp, and source of each update.
- Reject invalid status transitions with a meaningful error.
- Support frequent and concurrent updates.

3. Live Updates to Connected Clients

- Notify connected clients immediately when an order is created or updated.
- Ensure only authorized clients receive relevant updates.
- Updates must include order ID, status, timestamp, and metadata.

4. Current State Retrieval

- Retrieve the current state of a single order by ID.
- Retrieve a list of active orders with latest status and update time.

5. Historical Data Access

- Retrieve complete status history for an order.
- Query orders by date range, status, merchant, or customer reference.

6. Reliability Under Load

- Remain stable during concurrent updates and multiple connected clients.
- Avoid duplicate, out-of-order, or inconsistent updates.

7. Validation and Error Handling

- Validate all input data.
- Return clear errors for invalid or non-existent orders.
- Handle unexpected failures safely.

Timeline

Expected completion time is **1 week**. Candidates who complete the assignment earlier than the deadline may be given preference during evaluation.

Deliverables

- Source code shared via a GitHub repository with a clear README.
- Documentation describing the data model, live update mechanism, and concurrency handling.
- If a full-stack implementation is included and hosted, this will be appreciated (include hosted URL and deployment notes).

Questions and Clarifications

If you have any questions or require clarification at any point during the assignment, please reach out.