SYSTEM DESIGN ASSESSMENT

Position: Software Engineer (Backend / Fullstack)

Duration: 2 days

Deliverables: Technical Documentation & Architecture Diagrams

1. MISSION OVERVIEW

Design a core ride-hailing system (eg: Uber, Grab) focusing on the end-to-end lifecycle of a ride request and driver matching.

2. SYSTEM REQUIREMENTS

Functional Requirements

- Users: drivers and riders
- Riders can request for trips
- The system will match a rider with a driver
- After being matched, the rider and driver can see each other location util the trip finished

Non-functional Requirements

- High availability
- Scale globally
- Efficient rider-driver matching

3. SCOPE OF WORK

Your proposal must address the following components:

- **Rough Estimation:** Provide back-of-the-envelope calculations for throughput (QPS) and storage
    - *Assumptions:* 10 million daily active riders and 1 million daily active drivers.
- **Data Model Design:** Propose a simplified database model.
- **API Design:** Define 3-5 core API endpoints. The API format is up to you.
- **Detailed Design:** Provide a high-level backend architecture diagram with descriptions.
- **Bottlenecks:** Identify potential failure points and suggest mitigation or optimization strategies.

4. REVIEW SESSION INSTRUCTIONS

During the technical interview, be prepared to:

- Whiteboard interview
- Justify Design Choices
- Analyze Trade-offs
- Deep dive and discuss further.