Uber Data Engineer Interview Guide – Experienced 5+

Overview

Round 1: Coding & Business Process Screen (BPS)

Round 2: Coding & SQL

Round 3: Data Modeling

Round 4: System Design

Round 5: Collaboration & Leadership

Round 1: Coding & Business Process Screen (BPS)

The first round tests technical expertise in SQL and Spark internals, requiring both coding proficiency and a deep understanding of distributed data processing.

1. Hard SQL Question

- **Preparation Tip:** Be ready for complex queries involving:
  - Window functions (ROW_NUMBER, RANK).
  - Advanced JOINs and subqueries.
  - Aggregations with GROUP BY and HAVING clauses.
- **Example Question:** Write a query to find the top three customers by total revenue within each region.

2. Spark Internals

- **Core Concepts to Understand:**
  - **RDDs (Resilient Distributed Datasets):** How Spark handles distributed data.
  - **Lazy Evaluation:** The optimization mechanism for transformations.
  - **Shuffle Operations:** Understanding performance impact and optimization.
  - **Execution DAG (Directed Acyclic Graph):** How Spark schedules and executes tasks.
- **Example Question:** Explain how Spark handles data partitioning and the role of shuffles in performance tuning.

Round 2: Coding & SQL

This round combines coding challenges in SQL and Data Structures & Algorithms (DSA).

1. Hard SQL Question

- **Focus:** Master complex query writing and optimization techniques.
- **Example:** Given a table with sales data, write a query to find consecutive days with decreasing revenue.

2. Medium DSA Question

- **Key Topics:**
  - **Arrays & Strings:** Handling contiguous subarrays, pattern matching.
  - **Stacks & Queues:** Solving problems like balanced parentheses and LRU Cache.
  - **Linked Lists:** Reversal, merging sorted lists.
  - **Binary Search & Recursion:** Solving problems efficiently.
  - **Basic Dynamic Programming:** Understanding memoization and tabulation.
- **Example Question:** Write a function to find the longest palindromic substring in a given string.

Round 3: Data Modeling

This round evaluates your ability to design data models for real-world applications.

1. Task: Build a Data Model

- **Scenario Example:** Design a data model for a ride-hailing app.
- **Discussion Points:**
  - **Fact & Dimension Tables:** Differentiate between transactional data (facts) and descriptive data (dimensions).
  - **Bridge Tables:** Use when dealing with many-to-many relationships.
  - **Star vs. Snowflake Schema:** Explain their advantages and disadvantages.
  - **Slowly Changing Dimensions (SCDs):** Implement SCD Type 1, Type 2, or Type 3 based on business needs.

2. SQL Queries Against the Model

- **Focus:** Writing efficient queries and explaining their complexities.
- **Example Question:** Write a query to find the total number of rides per driver in the last 30 days.

Round 4: System Design

The system design round assesses your ability to create scalable and efficient architectures.

1. Design Scenarios

- **Example Scenarios:**
  - Build an executive dashboard for reporting.
  - Design a data pipeline for streaming analytics.
- **Key Considerations:**
  - **Functional vs. Non-Functional Requirements:** Clarify data latency, throughput, and availability needs.
  - **File Formats:** Discuss the pros and cons of formats like Parquet, ORC, and Avro.
  - **Ingestion Tools:** Consider Kafka, Flume, or Kinesis.
  - **Database Choices:** Choose between relational (PostgreSQL, MySQL) and non-relational (MongoDB, Cassandra) databases.

2. Best Practices in System Design

- **Discuss:** Scalability, fault tolerance, data partitioning, and replication strategies.

Round 5: Collaboration & Leadership

The final round assesses your soft skills and leadership abilities.

1. Leadership Styles & Conflict Resolution

- **Discussion Topics:**
  - Handling team conflicts.
  - Celebrating team achievements.
  - Managing differing opinions.
- **Example Scenario:** How would you handle a situation where two team members disagree on a technical approach?

2. Exit Reasons & Career Goals

- Be honest but professional about why you are considering leaving your current role. Emphasize growth opportunities and alignment with the company's mission.