Chryselys Data Engineer Interview Guide – Experienced 3+

Interview Process Breakdown

Round 1: Fundamental and Practical Knowledge

- **Focus Areas**: SQL, Python, Data Warehousing, and basic problem-solving.
- **Objective**: Evaluate the candidate's ability to work with foundational data engineering concepts and their problem-solving approach.

Round 2: Advanced Tools and Scenarios

- **Focus Areas**: Big Data tools (Hive, Sqoop, Spark), cloud services (AWS, Delta Lake), and programming concepts (Scala).
- **Objective**: Assess the candidate's expertise in using modern data engineering tools, understanding advanced concepts, and their ability to solve real-world scenarios.

Detailed Insights on Each Round

Round 1: Fundamental and Practical Knowledge

1. **Introduce Yourself**
   - The interviewer started with the classic "Tell me about yourself" question, aiming to gauge the candidate's communication skills and professional background.
   - **Tip**: Use this opportunity to highlight your relevant experience, recent projects, and technical expertise.
2. **Recent Projects and Challenges**

   Question: "Explain the recent projects you have worked on."

   Follow-ups:
   - What challenges did you face during these projects?
   - What strategies did you use to monitor and troubleshoot failed pipelines?

   Insight: The interviewer was looking for practical experience and a systematic approach to handling issues.
3. **Data Warehousing Concepts**

   Question: "What is a Data Warehouse, and can you explain its Tier-1 and Tier-2 architecture?"

   Tip: Emphasize the structured nature of data warehouses and explain tiered architectures in simple terms.

4. **OLTP vs OLAP**

   Question: “What is the difference between OLTP and OLAP?”

   Example Answer: OLTP systems handle transactional data with frequent, small operations, while OLAP systems focus on analytical queries over large datasets.

5. **Join Operations**

   Scenario: Analyze the output of various joins (LEFT, RIGHT, INNER, CROSS, FULL OUTER) on the following tables:

Table 1:

Col
a
a
a

Table 2:

Col
a
a
a
a
a

   Tip: Understand the nuances of join operations and focus on edge cases like duplicates.

6. **SQL Query**

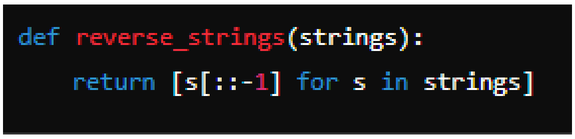
   Question: “Write a query to get the names of all employees who are managers with five or more direct reports.”

   Insight: Use GROUP BY and HAVING to handle such queries efficiently.

7. **Python Problem**

   Question: Write a Python function to reverse all strings in a list.

   Example:

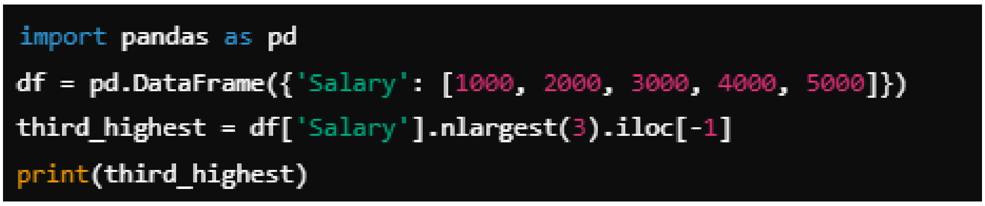


```python
def reverse_strings(strings):
    return [s[::-1] for s in strings]
```

8. **Pandas Problem**

   Question: Write code to find the third-highest salary in a dataset using Pandas.

   Solution:



```python
import pandas as pd
df = pd.DataFrame({'Salary': [1000, 2000, 3000, 4000, 5000]})
third_highest = df['Salary'].nlargest(3).iloc[-1]
print(third_highest)
```

Round 2: Advanced Tools and Scenarios

1. **Sqoop Command**

   Question: Write a Sqoop command to import all relational tables from a MySQL database into HDFS.

   Solution:

   sqoop import-all-tables --connect jdbc:mysql://<host>:<port>/<database> --username <user> --password <password> --target-dir /hdfs/target/path

2. **Scheduling Spark Jobs in Databricks**

   Question: How would you schedule Spark jobs using Databricks?

   Insight: Explain using Databricks' job scheduling interface, specifying cluster settings and cron expressions.

3. **Hive Basics**

   Question: Explain Hive, its purpose, and its default metadata storage.

   Follow-up: Why does Hive use Derby by default, and what alternatives are used in production?

   Tip: Highlight the scalability of production databases like MySQL or PostgreSQL for metadata storage.

4. **Data Lake vs Data Warehouse**

   Question: Explain the differences between a Data Lake and a Data Warehouse.

   Focus: Talk about schema-on-read vs schema-on-write and use cases for both.

5. **AWS Concepts**

   Question: Describe an AWS EC2 instance and how IAM roles/policies enhance security.

   Follow-up: Discuss S3's advantages, including scalability and durability.

6. **Delta Lake**

   Question: What file format does Delta Lake use, and why is it beneficial?

   Insight: Delta Lake uses Parquet format, offering ACID transactions and scalability.

7. **Scala Currying**

   Question: What is currying in Scala?

   Example: Currying transforms a function with multiple parameters into a series of functions, each taking one parameter.

8. **Higher-Order Functions in Scala**

   Question: Write a higher-order function to filter values greater than a threshold in a list.

   Solution:

```
def filterThreshold(threshold: Int, values: List[Int]): List[Int] = {
  values.filter(_ > threshold)
}
```

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