TECH mahindra

Data Engineering Interview Questions

Ankita Gulati

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Job Details

- **Position:** Data Engineer
- **Experience:** 2+ years
- **Location:** Pune / Mumbai
- **Work mode:** Hybrid
- **Compensation:** ₹10-12LPA
- **Total Rounds:** 3
- **Top Required Skills:**

1. SQL
2. PySpark / Python
3. AWS
4. Data Engineering Concepts

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Round 1
Core Technical Concepts

1. Can you briefly introduce yourself and summarize your professional background?
2. Can you walk me through your current project, including its data architecture, technologies used, and your specific role?
3. What were the main challenges you faced in your project, and how did you resolve them?
4. How would you delete duplicate rows in a SQL table? Can you explain multiple approaches?
5. What are the differences between ROW_NUMBER, RANK, and DENSE_RANK functions? Provide examples for each.
6. Write a SQL query using the RANK function to identify the second-highest salary in a table.
7. Given a transaction table, write a SQL query to calculate the cumulative total per month.
8. How would you identify employees earning more than their managers (given an Employee table with Id, Name, Salary, and ManagerId)?

9. What is the role of Dataproc in GCP, and when would you use it over BigQuery?
10. Can you explain the differences between external and internal tables in BigQuery?
11. What are the steps to create an external table in BigQuery? What about an internal table?
12. How do you create a partitioned table in BigQuery, and why is partitioning important?
13. How would you optimize queries in BigQuery to reduce cost and execution time?
14. Explain the differences between Star Schema and Snowflake Schema. Which one is better for reporting and why?
15. What are Slowly Changing Dimensions (SCDs)? How would you implement SCD Type 2?
16. Explain ETL vs ELT with examples.
17. What is the CAP theorem, and how does it apply to distributed databases like BigQuery or Cassandra?

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Round 2
Problem Solving

1. Can you provide a short introduction highlighting your key skills and expertise?
2. Walk me through a logistics data warehouse management project you worked on—what were the objectives, challenges, and business outcomes?
3. If you had to redesign your project today, what changes would you make to improve efficiency or cost?
4. Write a Python program to check if a given number is prime.
5. Write a Python function to check if two strings are anagrams.
6. Write a Python function that merges two strings alternatively (e.g., word1 = "abc", word2 = "pqr" → "apbqcr").
7. Given a list of integers, write a Python function to return the top 3 largest numbers without sorting the entire list.

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8. Given two tables with a common column, how would you calculate the counts of rows for INNER JOIN, LEFT JOIN, and RIGHT JOIN?

9. Given two sample tables (with duplicates and NULLs), predict the output of different join types (INNER, LEFT, RIGHT, CROSS).

10. Write a query using window functions to assign row numbers within each department of employees ordered by salary.

11. What are executors in Airflow? Can you explain different types (Local, Celery, Kubernetes) and their use cases?

12. How would you monitor and restart a failed Airflow DAG?

13. How do you handle dependencies and scheduling in Airflow?

14. How would you handle long-running PySpark or SQL jobs on production clusters?

15. How do you monitor pipelines in cloud platforms (GCP, AWS, Azure)?

16. What strategies do you use to optimize Spark jobs (e.g., partitioning, caching, broadcast joins)?

Round 3
HR Discussion

1. Can you briefly introduce yourself and share your career goals?
2. Why are you looking to switch from your current company?
3. Why do you want to join Tech Mahindra?
4. Where do you see yourself in the next 3 years?
5. How do you keep yourself updated with the latest technologies in data engineering?
6. What are your salary expectations?
7. What is your notice period?

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Thank You

Best of luck with your upcoming interviews — you've got this!

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