**1. Why is the OLTP system normalized and the OLAP system denormalized?**  
OLTP (Online Transaction Processing) systems are typically normalized to reduce redundancy and keep the data consistent. This helps make transactions fast and efficient, which is important for day-to-day operations like inserting, updating, or deleting records.

On the other hand, OLAP (Online Analytical Processing) systems are usually denormalized to make reporting and analysis faster. Since OLAP systems deal with large volumes of data for things like dashboards and business insights, having fewer joins and more consolidated data structures improves query performance.

**2. What challenges would you face if you ran analytical queries directly on the OLTP system?**  
- Running heavy analytical queries on an OLTP system can cause some serious issues. These queries are often resource-intensive, which can slow down the system and affect real-time operations like sales transactions or user logins. You also risk locking tables or overwhelming the system, which can lead to delays or even downtime for regular users. It’s just not built for that kind of load.

**3. How can automation (e.g., scheduled ETL jobs) help in a real-world data pipeline?**  
- Automation plays a huge role in keeping data pipelines efficient and reliable. Scheduled ETL (Extract, Transform, Load) jobs can move data from OLTP systems to OLAP environments on a regular basis without manual effort. This ensures data is always up to date for reporting and analysis. It also reduces human error, speeds up processing, and helps businesses make faster, more accurate decisions based on fresh data.