

## 1. Why use a star schema instead of a normalized schema?

A star schema is preferred over a normalized schema primarily to **simplify data retrieval for analysis and reporting**. Star schemas are optimized for read operations, which are crucial in data warehousing scenarios. They achieve this simplification by having fewer tables and simpler relationships, reducing the complexity of queries and improving performance. This makes them well-suited for Online Analytical Processing (OLAP).

## 2. What are the benefits of separating facts from dimensions?

- **Improved Query Performance:** By organizing data into a central fact table and surrounding dimension tables, star schemas minimize the number of joins required for complex queries. This leads to faster query execution, which is essential for data analysis.
- **Simplified Data Retrieval:** The structure of a star schema makes it easier to understand and navigate the data. Business users can more readily write and comprehend queries, as the relationships between data are straightforward.
- **Enhanced Data Organization:** Dimensions provide context to the facts. Facts represent the core business data (e.g., sales), while dimensions provide descriptive attributes (e.g., product details, customer information) that allow for filtering, grouping, and analysis of the facts.
- **Support for Drill-Down Analysis:** Dimension tables enable users to "drill down" into the data to explore it at different levels of granularity. For example, a user can start with overall sales figures and then drill down to sales by region, then by store, and then by product.

## 3. What types of business decisions could this warehouse support?

- **Sales Analysis:** Analyzing sales trends, identifying top-selling products, evaluating sales performance by region or store, and understanding the impact of promotions.
- **Customer Analysis:** Identifying customer segments, understanding customer behavior, analyzing customer lifetime value, and predicting customer churn.
- **Inventory Management:** Tracking inventory levels, optimizing stock levels, identifying slow-moving items, and forecasting demand.
- **Financial Performance:** Analyzing revenue, profitability, and expenses; tracking key performance indicators (KPIs); and generating financial reports.
- **Marketing Effectiveness:** Measuring the effectiveness of marketing campaigns, analyzing campaign ROI, and identifying target audiences.
- **Supply Chain Optimization:** Analyzing supplier performance, optimizing delivery routes, and managing logistics.