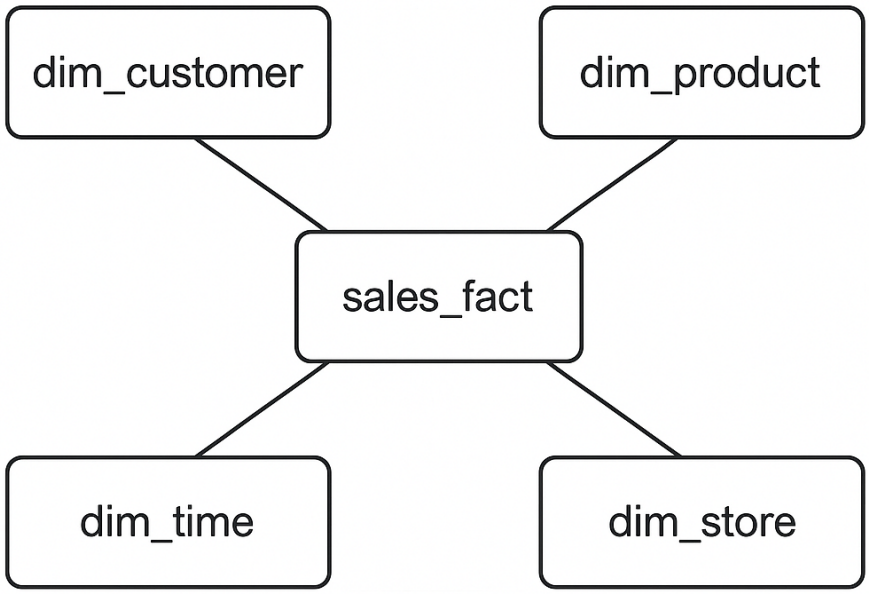
Task 1: Data Warehouse Design Report

1. Star Schema Design

The data warehouse design follows a star schema model for a retail company that tracks sales, customers, products, and time. The schema includes one fact table (SalesFact) and four dimension tables (CustomerDim, ProductDim, TimeDim, CategoryDim). The design supports queries such as total sales by product category per quarter, customer demographics analysis, and inventory trends.



2. Why Star Schema Over Snowflake Schema

The star schema was chosen because it is simpler and more efficient for querying large datasets in OLAP systems. It reduces the number of joins needed compared to a snowflake schema, which improves query performance. It also makes the structure easier for business analysts to understand.

3. SQL CREATE TABLE Statements (SQLite Syntax)

```
CREATE TABLE CustomerDim (
    CustomerID INTEGER PRIMARY KEY,
    Name TEXT,
    Location TEXT,
    Age INTEGER,
    Gender TEXT
);

CREATE TABLE ProductDim (
```

```
    ProductID INTEGER PRIMARY KEY,
    ProductName TEXT,
    CategoryID INTEGER,
    Price REAL
);

CREATE TABLE CategoryDim (
    CategoryID INTEGER PRIMARY KEY,
    CategoryName TEXT
);

CREATE TABLE TimeDim (
    TimeID INTEGER PRIMARY KEY,
    Date TEXT,
    Quarter TEXT,
    Year INTEGER
);

CREATE TABLE SalesFact (
    SaleID INTEGER PRIMARY KEY,
    CustomerID INTEGER,
    ProductID INTEGER,
    TimeID INTEGER,
    Quantity INTEGER,
    SalesAmount REAL,
    FOREIGN KEY (CustomerID) REFERENCES CustomerDim(CustomerID),
    FOREIGN KEY (ProductID) REFERENCES ProductDim(ProductID),
    FOREIGN KEY (TimeID) REFERENCES TimeDim(TimeID)
);
```