```
-- ========================
-- 1. STAR SCHEMA DIMENSION TABLES
-- ========================

-- Time Dimension
CREATE TABLE dim_time (
   time_id INT PRIMARY KEY,
   day INT,
   month INT,
   quarter INT,
   year INT
);

-- Product Dimension
CREATE TABLE dim_product (
   product_id INT PRIMARY KEY,
   product_name VARCHAR2(100),
   product_category_id INT,
   product_category_name VARCHAR2(100)
);

-- Branch Dimension
CREATE TABLE dim_branch (
   branch_id INT PRIMARY KEY,
   branch_name VARCHAR2(100),
   manager_id INT,
   manager_name VARCHAR2(100)
);

-- Location Dimension
CREATE TABLE dim_location (
   location_id INT PRIMARY KEY,
   city VARCHAR2(50),
   state VARCHAR2(50),
   country VARCHAR2(50)
);

-- ========================
-- 2. FACT TABLE
-- ========================
```

```
CREATE TABLE fact_sales (
   fact_id INT PRIMARY KEY,
   time_id INT,
   product_id INT,
   branch_id INT,
   location_id INT,
   dollars_sold NUMBER(10, 2),
   units_sold INT,
   FOREIGN KEY (time_id) REFERENCES dim_time(time_id),
   FOREIGN KEY (product_id) REFERENCES dim_product(product_id),
   FOREIGN KEY (branch_id) REFERENCES dim_branch(branch_id),
   FOREIGN KEY (location_id) REFERENCES dim_location(location_id)
);

-- ========================
-- 3. INSERT DATA INTO STAR SCHEMA
-- ========================

-- Time
INSERT INTO dim_time VALUES (1, 1, 1, 1, 2023);
INSERT INTO dim_time VALUES (2, 15, 2, 1, 2023);
INSERT INTO dim_time VALUES (3, 10, 4, 2, 2023);
INSERT INTO dim_time VALUES (4, 20, 6, 2, 2023);
INSERT INTO dim_time VALUES (5, 5, 9, 3, 2023);

-- Product
INSERT INTO dim_product VALUES (101, 'Smartphone', 1, 'Electronics');
INSERT INTO dim_product VALUES (102, 'Laptop', 1, 'Electronics');
INSERT INTO dim_product VALUES (103, 'Fridge', 2, 'Appliances');
INSERT INTO dim_product VALUES (104, 'Microwave', 2, 'Appliances');
INSERT INTO dim_product VALUES (105, 'TV', 1, 'Electronics');

-- Branch
INSERT INTO dim_branch VALUES (201, 'Mumbai Branch', 301, 'Anil Kumar');
INSERT INTO dim_branch VALUES (202, 'Pune Branch', 302, 'Rita Mehta');
INSERT INTO dim_branch VALUES (203, 'Delhi Branch', 303, 'Sunil Joshi');
INSERT INTO dim_branch VALUES (204, 'Bangalore Branch', 304, 'Neha Shah');
INSERT INTO dim_branch VALUES (205, 'Hyderabad Branch', 305, 'Amit Singh');

-- Location
```

```
INSERT INTO dim_location VALUES (301, 'Mumbai', 'Maharashtra', 'India');
INSERT INTO dim_location VALUES (302, 'Pune', 'Maharashtra', 'India');
INSERT INTO dim_location VALUES (303, 'Delhi', 'Delhi', 'India');
INSERT INTO dim_location VALUES (304, 'Bangalore', 'Karnataka', 'India');
INSERT INTO dim_location VALUES (305, 'Hyderabad', 'Telangana', 'India');

-- Fact Table
INSERT INTO fact_sales VALUES (1, 1, 101, 201, 301, 10000.50, 5);
INSERT INTO fact_sales VALUES (2, 2, 102, 202, 302, 25000.00, 3);
INSERT INTO fact_sales VALUES (3, 3, 103, 203, 303, 18000.75, 2);
INSERT INTO fact_sales VALUES (4, 4, 104, 204, 304, 9500.00, 4);
INSERT INTO fact_sales VALUES (5, 5, 105, 205, 305, 30000.00, 6);

-- ========================
-- 4. SNOWFLAKE DIMENSION TABLES
-- ========================

-- Product Category
CREATE TABLE dim_product_category_snowflake (
   product_category_id INT PRIMARY KEY,
   product_category_name VARCHAR2(100)
);

-- Manager
CREATE TABLE dim_manager_snowflake (
   manager_id INT PRIMARY KEY,
   manager_name VARCHAR2(100)
);

-- State
CREATE TABLE dim_state_snowflake (
   state VARCHAR2(50) PRIMARY KEY,
   country VARCHAR2(50)
);

-- ========================
-- 5. ALTER FACT TABLE FOR SNOWFLAKE REFERENCES
-- ========================
ALTER TABLE fact_sales ADD (product_category_id INT, manager_id INT, state
VARCHAR2(50));
```

```
ALTER TABLE fact_sales ADD CONSTRAINT fk_product_category FOREIGN KEY
(product_category_id)
REFERENCES dim_product_category_snowflake(product_category_id);

ALTER TABLE fact_sales ADD CONSTRAINT fk_manager FOREIGN KEY
(manager_id)
REFERENCES dim_manager_snowflake(manager_id);

ALTER TABLE fact_sales ADD CONSTRAINT fk_state FOREIGN KEY (state)
REFERENCES dim_state_snowflake(state);

-- ========================
-- 6. INSERT DATA INTO SNOWFLAKE TABLES
-- ========================

INSERT INTO dim_product_category_snowflake VALUES (1, 'Electronics');
INSERT INTO dim_product_category_snowflake VALUES (2, 'Appliances');

INSERT INTO dim_manager_snowflake VALUES (301, 'Anil Kumar');
INSERT INTO dim_manager_snowflake VALUES (302, 'Rita Mehta');
INSERT INTO dim_manager_snowflake VALUES (303, 'Sunil Joshi');
INSERT INTO dim_manager_snowflake VALUES (304, 'Neha Shah');
INSERT INTO dim_manager_snowflake VALUES (305, 'Amit Singh');

INSERT INTO dim_state_snowflake VALUES ('Maharashtra', 'India');
INSERT INTO dim_state_snowflake VALUES ('Delhi', 'India');
INSERT INTO dim_state_snowflake VALUES ('Karnataka', 'India');
INSERT INTO dim_state_snowflake VALUES ('Telangana', 'India');

-- ========================
-- 7. OLAP OPERATIONS
-- ========================

-- === SLICE ===
BEGIN
   DBMS_OUTPUT.PUT_LINE('SLICE 1: Sales data for product_id = 101');
END;
/
SELECT * FROM fact_sales WHERE product_id = 101;
```

```
BEGIN
   DBMS_OUTPUT.PUT_LINE('SLICE 2: Sales data for branch_id = 202');
END;
/
SELECT * FROM fact_sales WHERE branch_id = 202;

-- === DICE ===
BEGIN
   DBMS_OUTPUT.PUT_LINE('DICE 1: Sales > 15000 and units_sold >= 3');
END;
/
SELECT * FROM fact_sales
WHERE dollars_sold > 15000 AND units_sold >= 3;

BEGIN
   DBMS_OUTPUT.PUT_LINE('DICE 2: Sales in Maharashtra with Electronics
category');
END;
/
SELECT f.* FROM fact_sales f
JOIN dim_product_category_snowflake pc ON f.product_category_id =
pc.product_category_id
WHERE f.state = 'Maharashtra' AND pc.product_category_name = 'Electronics';

-- === DRILL-DOWN ===
BEGIN
   DBMS_OUTPUT.PUT_LINE('DRILL-DOWN 1: Sales by month and product');
END;
/
SELECT t.month, p.product_name, SUM(f.dollars_sold) AS total_sales
FROM fact_sales f
JOIN dim_time t ON f.time_id = t.time_id
JOIN dim_product p ON f.product_id = p.product_id
GROUP BY t.month, p.product_name
ORDER BY t.month;

BEGIN
   DBMS_OUTPUT.PUT_LINE('DRILL-DOWN 2: Units sold by branch and city');
END;
```

```
/
SELECT b.branch_name, l.city, SUM(f.units_sold) AS total_units
FROM fact_sales f
JOIN dim_branch b ON f.branch_id = b.branch_id
JOIN dim_location l ON f.location_id = l.location_id
GROUP BY b.branch_name, l.city;

-- === ROLL-UP ===
BEGIN
   DBMS_OUTPUT.PUT_LINE('ROLL-UP 1: Total sales by year');
END;
/
SELECT t.year, SUM(f.dollars_sold) AS total_sales
FROM fact_sales f
JOIN dim_time t ON f.time_id = t.time_id
GROUP BY t.year;

BEGIN
   DBMS_OUTPUT.PUT_LINE('ROLL-UP 2: Total units sold by country');
END;
/
SELECT l.country, SUM(f.units_sold) AS total_units
FROM fact_sales f
JOIN dim_location l ON f.location_id = l.location_id
GROUP BY l.country;

-- === PIVOT ===
BEGIN
   DBMS_OUTPUT.PUT_LINE('PIVOT 1: Units sold by product');
END;
/
SELECT * FROM (
   SELECT p.product_name, f.units_sold
   FROM fact_sales f
   JOIN dim_product p ON f.product_id = p.product_id
)
PIVOT (
   SUM(units_sold) FOR product_name IN ('Smartphone' AS Smartphone,
'Laptop' AS Laptop, 'TV' AS TV)
);
```

```
BEGIN
   DBMS_OUTPUT.PUT_LINE('PIVOT 2: Dollars sold by quarter');
END;
/
SELECT * FROM (
   SELECT t.quarter, f.dollars_sold
   FROM fact_sales f
   JOIN dim_time t ON f.time_id = t.time_id
)
PIVOT (
   SUM(dollars_sold) FOR quarter IN (1 AS Q1, 2 AS Q2, 3 AS Q3)
);
```