```
-- ============================================
-- STEP 1: CREATE STAR SCHEMA DIMENSION TABLES
-- ============================================

CREATE TABLE dim_item (
   item_id NUMBER PRIMARY KEY,
   item_name VARCHAR2(100),
   item_category VARCHAR2(50)
);

CREATE TABLE dim_consinger (
   consigner_id NUMBER PRIMARY KEY,
   consigner_name VARCHAR2(100),
   consigner_location VARCHAR2(50)
);

CREATE TABLE dim_buyer (
   buyer_id NUMBER PRIMARY KEY,
   buyer_name VARCHAR2(100),
   buyer_location VARCHAR2(50)
);

CREATE TABLE dim_time (
   time_id NUMBER PRIMARY KEY,
   day DATE,
   month NUMBER,
   year NUMBER
);

-- ============================================
-- STEP 2: CREATE FACT TABLE
-- ============================================

CREATE TABLE fact_auction_data (
   auction_id NUMBER PRIMARY KEY,
   item_id NUMBER,
   consigner_id NUMBER,
   buyer_id NUMBER,
   time_id NUMBER,
   sold_price NUMBER,
```

```
    low_estimate NUMBER,
    high_estimate NUMBER,
    reserve_price NUMBER,
    FOREIGN KEY (item_id) REFERENCES dim_item(item_id),
    FOREIGN KEY (consigner_id) REFERENCES dim_consinger(consigner_id),
    FOREIGN KEY (buyer_id) REFERENCES dim_buyer(buyer_id),
    FOREIGN KEY (time_id) REFERENCES dim_time(time_id)
);

-- ============================================
-- STEP 3: INSERT DATA INTO STAR SCHEMA
-- ============================================

-- Insert Data for Star Schema Tables

INSERT INTO dim_item VALUES (1, 'Mona Lisa', 'Art');
INSERT INTO dim_item VALUES (2, 'Starry Night', 'Art');
INSERT INTO dim_item VALUES (3, 'The Persistence of Memory', 'Art');
INSERT INTO dim_item VALUES (4, 'The Scream', 'Art');
INSERT INTO dim_item VALUES (5, 'Guernica', 'Art');

INSERT INTO dim_consinger VALUES (1, 'John Doe', 'New York');
INSERT INTO dim_consinger VALUES (2, 'Jane Smith', 'Paris');
INSERT INTO dim_consinger VALUES (3, 'Michael Brown', 'London');
INSERT INTO dim_consinger VALUES (4, 'Emily White', 'Rome');
INSERT INTO dim_consinger VALUES (5, 'Sarah Green', 'Berlin');

INSERT INTO dim_buyer VALUES (1, 'Alice Johnson', 'California');
INSERT INTO dim_buyer VALUES (2, 'Bob Williams', 'Texas');
INSERT INTO dim_buyer VALUES (3, 'Charlie Davis', 'Florida');
INSERT INTO dim_buyer VALUES (4, 'David Evans', 'New York');
INSERT INTO dim_buyer VALUES (5, 'Eve Harris', 'California');

INSERT INTO dim_time VALUES (1, TO_DATE('2025-01-01', 'YYYY-MM-DD'), 1,
2025);
INSERT INTO dim_time VALUES (2, TO_DATE('2025-01-02', 'YYYY-MM-DD'), 1,
2025);
INSERT INTO dim_time VALUES (3, TO_DATE('2025-02-01', 'YYYY-MM-DD'), 2,
2025);
```

```
INSERT INTO dim_time VALUES (4, TO_DATE('2025-03-01', 'YYYY-MM-DD'), 3,
2025);
INSERT INTO dim_time VALUES (5, TO_DATE('2025-03-05', 'YYYY-MM-DD'), 3,
2025);

-- Insert Data for Fact Table
INSERT INTO fact_auction_data VALUES (1, 1, 1, 1, 1, 1000000, 1200000,
1500000, 1300000);
INSERT INTO fact_auction_data VALUES (2, 2, 2, 2, 2, 2000000, 2200000,
2500000, 2300000);
INSERT INTO fact_auction_data VALUES (3, 3, 3, 3, 3, 1500000, 1700000,
1900000, 1800000);
INSERT INTO fact_auction_data VALUES (4, 4, 4, 4, 4, 500000, 600000, 700000,
650000);
INSERT INTO fact_auction_data VALUES (5, 5, 5, 5, 5, 2500000, 2700000,
3000000, 2800000);

-- ============================================
-- STEP 4: CREATE SNOWFLAKE SCHEMA TABLES
-- ============================================

CREATE TABLE dim_item_snowflake (
   item_snowflake_id NUMBER PRIMARY KEY,
   item_name VARCHAR2(100),
   item_category VARCHAR2(50)
);

CREATE TABLE dim_consinger_snowflake (
   consigner_snowflake_id NUMBER PRIMARY KEY,
   consigner_name VARCHAR2(100),
   consigner_location VARCHAR2(50)
);

CREATE TABLE dim_buyer_snowflake (
   buyer_snowflake_id NUMBER PRIMARY KEY,
   buyer_name VARCHAR2(100),
   buyer_location VARCHAR2(50)
);

CREATE TABLE dim_time_snowflake (
```

```
    time_snowflake_id NUMBER PRIMARY KEY,
    day DATE,
    month NUMBER,
    year NUMBER
);

-- ============================================
-- STEP 5: ALTER FACT TABLE TO ADD SNOWFLAKE REFERENCE
-- ============================================

ALTER TABLE fact_auction_data ADD (item_snowflake_id NUMBER);
ALTER TABLE fact_auction_data ADD (consigner_snowflake_id NUMBER);
ALTER TABLE fact_auction_data ADD (buyer_snowflake_id NUMBER);
ALTER TABLE fact_auction_data ADD (time_snowflake_id NUMBER);

-- Add Foreign Key References for Snowflake Tables
ALTER TABLE fact_auction_data
    ADD CONSTRAINT fk_item_snowflake FOREIGN KEY (item_snowflake_id)
REFERENCES dim_item_snowflake(item_snowflake_id);

ALTER TABLE fact_auction_data
    ADD CONSTRAINT fk_consinger_snowflake FOREIGN KEY
(consigner_snowflake_id) REFERENCES
dim_consinger_snowflake(consigner_snowflake_id);

ALTER TABLE fact_auction_data
    ADD CONSTRAINT fk_buyer_snowflake FOREIGN KEY (buyer_snowflake_id)
REFERENCES dim_buyer_snowflake(buyer_snowflake_id);

ALTER TABLE fact_auction_data
    ADD CONSTRAINT fk_time_snowflake FOREIGN KEY (time_snowflake_id)
REFERENCES dim_time_snowflake(time_snowflake_id);

-- ============================================
-- STEP 6: INSERT DATA INTO SNOWFLAKE SCHEMA TABLES
-- ============================================

-- Insert Data for Snowflake Tables

INSERT INTO dim_item_snowflake VALUES (1, 'Mona Lisa', 'Art');
```

```
INSERT INTO dim_item_snowflake VALUES (2, 'Starry Night', 'Art');
INSERT INTO dim_item_snowflake VALUES (3, 'The Persistence of Memory',
'Art');
INSERT INTO dim_item_snowflake VALUES (4, 'The Scream', 'Art');
INSERT INTO dim_item_snowflake VALUES (5, 'Guernica', 'Art');

INSERT INTO dim_consinger_snowflake VALUES (1, 'John Doe', 'New York');
INSERT INTO dim_consinger_snowflake VALUES (2, 'Jane Smith', 'Paris');
INSERT INTO dim_consinger_snowflake VALUES (3, 'Michael Brown', 'London');
INSERT INTO dim_consinger_snowflake VALUES (4, 'Emily White', 'Rome');
INSERT INTO dim_consinger_snowflake VALUES (5, 'Sarah Green', 'Berlin');

INSERT INTO dim_buyer_snowflake VALUES (1, 'Alice Johnson', 'California');
INSERT INTO dim_buyer_snowflake VALUES (2, 'Bob Williams', 'Texas');
INSERT INTO dim_buyer_snowflake VALUES (3, 'Charlie Davis', 'Florida');
INSERT INTO dim_buyer_snowflake VALUES (4, 'David Evans', 'New York');
INSERT INTO dim_buyer_snowflake VALUES (5, 'Eve Harris', 'California');

INSERT INTO dim_time_snowflake VALUES (1, TO_DATE('2025-01-01', 'YYYY-
MM-DD'), 1, 2025);
INSERT INTO dim_time_snowflake VALUES (2, TO_DATE('2025-01-02', 'YYYY-
MM-DD'), 1, 2025);
INSERT INTO dim_time_snowflake VALUES (3, TO_DATE('2025-02-01', 'YYYY-
MM-DD'), 2, 2025);
INSERT INTO dim_time_snowflake VALUES (4, TO_DATE('2025-03-01', 'YYYY-
MM-DD'), 3, 2025);
INSERT INTO dim_time_snowflake VALUES (5, TO_DATE('2025-03-05', 'YYYY-
MM-DD'), 3, 2025);

-- ================================
-- SLICE OPERATION
-- ================================

-- Example 1: Slice by Item ID (Mona Lisa)
BEGIN
  DBMS_OUTPUT.PUT_LINE('=== SLICE OPERATION ===');
  DBMS_OUTPUT.PUT_LINE('Description: Slice by Item ID (Mona Lisa)');
  DBMS_OUTPUT.PUT_LINE('Extracting data for Item ID: Mona Lisa');
END;
/
```

```
SELECT *
FROM fact_auction_data
WHERE item_id = 1;

-- Example 2: Slice by Year 2025
BEGIN
  DBMS_OUTPUT.PUT_LINE('Description: Slice by Year 2025');
  DBMS_OUTPUT.PUT_LINE('Extracting data for Year: 2025');
END;
/

SELECT *
FROM fact_auction_data
WHERE time_id IN (SELECT time_id FROM dim_time WHERE year = 2025);

-- ================================
-- DICE OPERATION
-- ================================

-- Example 1: Filter by Art Category and Consigner Location (New York)
BEGIN
  DBMS_OUTPUT.PUT_LINE('=== DICE OPERATION ===');
  DBMS_OUTPUT.PUT_LINE('Description: Filter data for items in Art category
sold in New York');
  DBMS_OUTPUT.PUT_LINE('Filtering by Item Category = Art and Consigner
Location = New York');
END;
/

SELECT f.*, i.item_name, c.consigner_name, b.buyer_name
FROM fact_auction_data f
JOIN dim_item i ON f.item_id = i.item_id
JOIN dim_consinger c ON f.consigner_id = c.consigner_id
JOIN dim_buyer b ON f.buyer_id = b.buyer_id
JOIN dim_time t ON f.time_id = t.time_id
WHERE i.item_category = 'Art' AND c.consigner_location = 'New York';

-- Example 2: Filter by Low Estimate and Buyer Location (California)
BEGIN
```

```
  DBMS_OUTPUT.PUT_LINE('Description: Filter data for Low Estimate between
1 million and 2 million, and Buyer Location = California');
  DBMS_OUTPUT.PUT_LINE('Filtering by Low Estimate and Buyer Location');
END;
/

SELECT f.*, i.item_name, b.buyer_name
FROM fact_auction_data f
JOIN dim_item i ON f.item_id = i.item_id
JOIN dim_buyer b ON f.buyer_id = b.buyer_id
WHERE f.low_estimate BETWEEN 1000000 AND 2000000
  AND b.buyer_location = 'California';

-- ================================
-- DRILL-DOWN OPERATION
-- ================================

-- Example 1: Drill down from Year to Month for Auctions in 2025
BEGIN
  DBMS_OUTPUT.PUT_LINE('=== DRILL-DOWN OPERATION ===');
  DBMS_OUTPUT.PUT_LINE('Description: Drill down from Year → Month for
Auctions in 2025');
  DBMS_OUTPUT.PUT_LINE('Drilling down from Year to Month for 2025
Auctions');
END;
/

SELECT t.year, t.month, COUNT(*) AS auction_count
FROM fact_auction_data f
JOIN dim_time t ON f.time_id = t.time_id
WHERE t.year = 2025
GROUP BY t.year, t.month
ORDER BY t.month;

-- Example 2: Drill down from Month to Day for Auctions in March 2025
BEGIN
  DBMS_OUTPUT.PUT_LINE('Description: Drill down from Month → Day for
Auctions in March 2025');
  DBMS_OUTPUT.PUT_LINE('Drilling down from Month to Day for Auctions in
March 2025');
```

```
END;
/

SELECT t.day, COUNT(*) AS auction_count
FROM fact_auction_data f
JOIN dim_time t ON f.time_id = t.time_id
WHERE t.year = 2025 AND t.month = 3
GROUP BY t.day
ORDER BY t.day;

-- ================================
-- ROLL-UP OPERATION
-- ================================

-- Example 1: Roll up from Day to Month for Auctions in 2025
BEGIN
  DBMS_OUTPUT.PUT_LINE('=== ROLL-UP OPERATION ===');
  DBMS_OUTPUT.PUT_LINE('Description: Roll up from Day → Month for
Auctions in 2025');
  DBMS_OUTPUT.PUT_LINE('Rolling up from Day to Month for Auctions in
2025');
END;
/

SELECT t.year, t.month, SUM(f.sold_price) AS total_sales
FROM fact_auction_data f
JOIN dim_time t ON f.time_id = t.time_id
WHERE t.year = 2025
GROUP BY t.year, t.month
ORDER BY t.month;

-- Example 2: Roll up from Day to Year for Auctions in California
BEGIN
  DBMS_OUTPUT.PUT_LINE('Description: Roll up from Day → Year for Auctions
in California');
  DBMS_OUTPUT.PUT_LINE('Rolling up from Day to Year for Auctions in
California');
END;
/
```

```
SELECT t.year, SUM(f.sold_price) AS total_sales
FROM fact_auction_data f
JOIN dim_time t ON f.time_id = t.time_id
JOIN dim_buyer b ON f.buyer_id = b.buyer_id
WHERE b.buyer_location = 'California'
GROUP BY t.year
ORDER BY t.year;

-- ================================
-- PIVOT OPERATION
-- ================================

-- Example 1: Pivot by Item Category and Month to Show Total Sales
BEGIN
  DBMS_OUTPUT.PUT_LINE('=== PIVOT OPERATION ===');
  DBMS_OUTPUT.PUT_LINE('Description: Pivot by Item Category and Month to
Show Total Sales');
  DBMS_OUTPUT.PUT_LINE('Pivoting by Item Category and Month');
END;
/

SELECT item_category,
      SUM(CASE WHEN month = 1 THEN sold_price ELSE 0 END) AS Jan,
      SUM(CASE WHEN month = 2 THEN sold_price ELSE 0 END) AS Feb,
      SUM(CASE WHEN month = 3 THEN sold_price ELSE 0 END) AS Mar
FROM fact_auction_data f
JOIN dim_item i ON f.item_id = i.item_id
JOIN dim_time t ON f.time_id = t.time_id
GROUP BY item_category
ORDER BY item_category;

-- Example 2: Pivot by Consigner Location and Item Category for Auction Counts
BEGIN
  DBMS_OUTPUT.PUT_LINE('Description: Pivot by Consigner Location and Item
Category for Auction Counts');
  DBMS_OUTPUT.PUT_LINE('Pivoting by Consigner Location and Item
Category');
END;
/
```

```
SELECT consigner_location,
    COUNT(CASE WHEN item_category = 'Art' THEN 1 END) AS Art_Auctions,
    COUNT(CASE WHEN item_category = 'Antiques' THEN 1 END) AS
Antiques_Auctions
FROM fact_auction_data f
JOIN dim_consinger c ON f.consigner_id = c.consigner_id
JOIN dim_item i ON f.item_id = i.item_id
GROUP BY consigner_location
ORDER BY consigner_location;
```