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

-- Surrogate Key Sequence for Star Schema
CREATE SEQUENCE seq_dim_item START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_dim_consinger START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_dim_buyer START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_dim_time START WITH 1 INCREMENT BY 1;

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 (seq_dim_item.NEXTVAL, 'Mona Lisa', 'Art');
INSERT INTO dim_item VALUES (seq_dim_item.NEXTVAL, 'Starry Night', 'Art');
INSERT INTO dim_item VALUES (seq_dim_item.NEXTVAL, 'The Persistence of
Memory', 'Art');
INSERT INTO dim_item VALUES (seq_dim_item.NEXTVAL, 'The Scream', 'Art');
INSERT INTO dim_item VALUES (seq_dim_item.NEXTVAL, 'Guernica', 'Art');

INSERT INTO dim_consinger VALUES (seq_dim_consinger.NEXTVAL, 'John Doe',
'New York');
INSERT INTO dim_consinger VALUES (seq_dim_consinger.NEXTVAL, 'Jane
Smith', 'Paris');
INSERT INTO dim_consinger VALUES (seq_dim_consinger.NEXTVAL, 'Michael
Brown', 'London');
INSERT INTO dim_consinger VALUES (seq_dim_consinger.NEXTVAL, 'Emily
White', 'Rome');
INSERT INTO dim_consinger VALUES (seq_dim_consinger.NEXTVAL, 'Sarah
Green', 'Berlin');

INSERT INTO dim_buyer VALUES (seq_dim_buyer.NEXTVAL, 'Alice Johnson',
'California');
```

```
INSERT INTO dim_buyer VALUES (seq_dim_buyer.NEXTVAL, 'Bob Williams',
'Texas');
INSERT INTO dim_buyer VALUES (seq_dim_buyer.NEXTVAL, 'Charlie Davis',
'Florida');
INSERT INTO dim_buyer VALUES (seq_dim_buyer.NEXTVAL, 'David Evans', 'New
York');
INSERT INTO dim_buyer VALUES (seq_dim_buyer.NEXTVAL, 'Eve Harris',
'California');

INSERT INTO dim_time VALUES (seq_dim_time.NEXTVAL, TO_DATE('2025-01-
01', 'YYYY-MM-DD'), 1, 2025);
INSERT INTO dim_time VALUES (seq_dim_time.NEXTVAL, TO_DATE('2025-01-
02', 'YYYY-MM-DD'), 1, 2025);
INSERT INTO dim_time VALUES (seq_dim_time.NEXTVAL, TO_DATE('2025-02-
01', 'YYYY-MM-DD'), 2, 2025);
INSERT INTO dim_time VALUES (seq_dim_time.NEXTVAL, TO_DATE('2025-03-
01', 'YYYY-MM-DD'), 3, 2025);
INSERT INTO dim_time VALUES (seq_dim_time.NEXTVAL, 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
-- ============================================

-- Surrogate Key Sequences for Snowflake Schema
CREATE SEQUENCE seq_dim_item_snowflake START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_dim_consinger_snowflake START WITH 1 INCREMENT
BY 1;
```

```
CREATE SEQUENCE seq_dim_buyer_snowflake START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_dim_time_snowflake START WITH 1 INCREMENT BY 1;

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 (seq_dim_item_snowflake.NEXTVAL,
'Mona Lisa', 'Art');
INSERT INTO dim_item_snowflake VALUES (seq_dim_item_snowflake.NEXTVAL,
'Starry Night', 'Art');
INSERT INTO dim_item_snowflake VALUES (seq_dim_item_snowflake.NEXTVAL,
'The Persistence of Memory', 'Art');
INSERT INTO dim_item_snowflake VALUES (seq_dim_item_snowflake.NEXTVAL,
'The Scream', 'Art');
INSERT INTO dim_item_snowflake VALUES (seq_dim_item_snowflake.NEXTVAL,
'Guernica', 'Art');

INSERT INTO dim_consinger_snowflake VALUES
(seq_dim_consinger_snowflake.NEXTVAL, 'John Doe', 'New York');
INSERT INTO dim_consinger_snowflake VALUES
(seq_dim_consinger_snowflake.NEXTVAL, 'Jane Smith', 'Paris');
INSERT INTO dim_consinger_snowflake VALUES
(seq_dim_consinger_snowflake.NEXTVAL, 'Michael Brown', 'London');
INSERT INTO dim_consinger_snowflake VALUES
(seq_dim_consinger_snowflake.NEXTVAL, 'Emily White', 'Rome');
```

```
INSERT INTO dim_consinger_snowflake VALUES
(seq_dim_consinger_snowflake.NEXTVAL, 'Sarah Green', 'Berlin');

INSERT INTO dim_buyer_snowflake VALUES
(seq_dim_buyer_snowflake.NEXTVAL, 'Alice Johnson', 'California');
INSERT INTO dim_buyer_snowflake VALUES
(seq_dim_buyer_snowflake.NEXTVAL, 'Bob Williams', 'Texas');
INSERT INTO dim_buyer_snowflake VALUES
(seq_dim_buyer_snowflake.NEXTVAL, 'Charlie Davis', 'Florida');
INSERT INTO dim_buyer_snowflake VALUES
(seq_dim_buyer_snowflake.NEXTVAL, 'David Evans', 'New York');
INSERT INTO dim_buyer_snowflake VALUES
(seq_dim_buyer_snowflake.NEXTVAL, 'Eve Harris', 'California');

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

-- ============================================
-- STEP 7: OLAP OPERATIONS
-- ============================================

-- SLICE OPERATION
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;
```

```
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
BEGIN
DBMS_OUTPUT.PUT_LINE('=== DICE OPERATION ===');
DBMS_OUTPUT.PUT_LINE('Description: Filter data for items in Art category sold
in 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';

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

-- ROLL-UP OPERATION
BEGIN
```

```
DBMS_OUTPUT.PUT_LINE('=== ROLL-UP OPERATION ===');
DBMS_OUTPUT.PUT_LINE('Description: Roll up from Day → 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;

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