```
-- ========================
-- 1. SEQUENCES FOR SURROGATE KEYS
-- ========================
CREATE SEQUENCE seq_time START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_product START WITH 101 INCREMENT BY 1;
CREATE SEQUENCE seq_branch START WITH 201 INCREMENT BY 1;
CREATE SEQUENCE seq_location START WITH 301 INCREMENT BY 1;
CREATE SEQUENCE seq_fact START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_product_category START WITH 1 INCREMENT BY 1;
CREATE SEQUENCE seq_manager START WITH 301 INCREMENT BY 1;

-- ========================
-- 2. STAR SCHEMA DIMENSION TABLES
-- ========================
CREATE TABLE dim_time (
   time_id INT PRIMARY KEY,
   day INT,
   month INT,
   quarter INT,
   year INT
);

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

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

CREATE TABLE dim_location (
   location_id INT PRIMARY KEY,
   city VARCHAR2(50),
   state VARCHAR2(50),
```

```
    country VARCHAR2(50)
);

-- ========================
-- 3. 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,
    product_category_id INT,
    manager_id INT,
    state VARCHAR2(50),
    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)
);

-- ========================
-- 4. SNOWFLAKE DIMENSION TABLES
-- ========================
CREATE TABLE dim_product_category_snowflake (
    product_category_id INT PRIMARY KEY,
    product_category_name VARCHAR2(100)
);

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

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

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-- ========================
-- 5. ADD FOREIGN KEYS TO FACT TABLE FOR SNOWFLAKE
-- ========================
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 STAR SCHEMA
-- ========================
-- Time
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 1, 1, 1, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 15, 2, 1, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 10, 4, 2, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 20, 6, 2, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 5, 9, 3, 2023);

-- Product
INSERT INTO dim_product VALUES (seq_product.NEXTVAL, 'Smartphone', 1,
'Electronics');
INSERT INTO dim_product VALUES (seq_product.NEXTVAL, 'Laptop', 1,
'Electronics');
INSERT INTO dim_product VALUES (seq_product.NEXTVAL, 'Fridge', 2,
'Appliances');
INSERT INTO dim_product VALUES (seq_product.NEXTVAL, 'Microwave', 2,
'Appliances');
INSERT INTO dim_product VALUES (seq_product.NEXTVAL, 'TV', 1,
'Electronics');

-- Branch
INSERT INTO dim_branch VALUES (seq_branch.NEXTVAL, 'Mumbai Branch',
301, 'Anil Kumar');
```

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INSERT INTO dim_branch VALUES (seq_branch.NEXTVAL, 'Pune Branch', 302,
'Rita Mehta');
INSERT INTO dim_branch VALUES (seq_branch.NEXTVAL, 'Delhi Branch', 303,
'Sunil Joshi');
INSERT INTO dim_branch VALUES (seq_branch.NEXTVAL, 'Bangalore Branch',
304, 'Neha Shah');
INSERT INTO dim_branch VALUES (seq_branch.NEXTVAL, 'Hyderabad Branch',
305, 'Amit Singh');

-- Location
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Mumbai',
'Maharashtra', 'India');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Pune',
'Maharashtra', 'India');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Delhi', 'Delhi',
'India');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Bangalore',
'Karnataka', 'India');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Hyderabad',
'Telangana', 'India');

-- ========================
-- 7. INSERT 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');

-- ========================
-- 8. INSERT DATA INTO FACT TABLE
```

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-- ========================
INSERT INTO fact_sales VALUES (seq_fact.NEXTVAL, 1, 101, 201, 301, 10000.50,
5, 1, 301, 'Maharashtra');
INSERT INTO fact_sales VALUES (seq_fact.NEXTVAL, 2, 102, 202, 302, 25000.00,
3, 1, 302, 'Maharashtra');
INSERT INTO fact_sales VALUES (seq_fact.NEXTVAL, 3, 103, 203, 303, 18000.75,
2, 2, 303, 'Delhi');
INSERT INTO fact_sales VALUES (seq_fact.NEXTVAL, 4, 104, 204, 304, 9500.00,
4, 2, 304, 'Karnataka');
INSERT INTO fact_sales VALUES (seq_fact.NEXTVAL, 5, 105, 205, 305, 30000.00,
6, 1, 305, 'Telangana');

-- ========================
-- 9. OLAP OPERATIONS
-- ========================
-- === SLICE ===
SELECT * FROM fact_sales WHERE product_id = 101;
SELECT * FROM fact_sales WHERE branch_id = 202;

-- === DICE ===
SELECT * FROM fact_sales WHERE dollars_sold > 15000 AND units_sold >= 3;

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 ===
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;

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;
```

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-- === ROLL-UP ===
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;

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 ===
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
   )
);

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
   )
);
```