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-- ====================================
-- STEP 1: CREATE SEQUENCES (Surrogate Keys)
-- ====================================
CREATE SEQUENCE seq_doctor START WITH 1;
CREATE SEQUENCE seq_patient START WITH 1;
CREATE SEQUENCE seq_time START WITH 1;
CREATE SEQUENCE seq_dept START WITH 1;
CREATE SEQUENCE seq_location START WITH 1;
CREATE SEQUENCE seq_fact START WITH 1;
CREATE SEQUENCE seq_doc_snow START WITH 1;
CREATE SEQUENCE seq_pat_snow START WITH 1;

-- ====================================
-- STEP 2: CREATE DIMENSION TABLES
-- ====================================
CREATE TABLE dim_doctor (
   doctor_id NUMBER PRIMARY KEY,
   doctor_name VARCHAR2(50),
   department VARCHAR2(50),
   specialization VARCHAR2(50)
);

CREATE TABLE dim_patient (
   patient_id NUMBER PRIMARY KEY,
   patient_name VARCHAR2(50),
   gender CHAR(1),
   city VARCHAR2(50)
);

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

CREATE TABLE dim_department (
   dept_id NUMBER PRIMARY KEY,
   dept_name VARCHAR2(50)
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);

CREATE TABLE dim_location (
   location_id NUMBER PRIMARY KEY,
   city VARCHAR2(50),
   state VARCHAR2(50)
);

CREATE TABLE dim_doctor_snowflake (
   doctor_id NUMBER PRIMARY KEY,
   doctor_name VARCHAR2(50),
   specialization VARCHAR2(50),
   dept_id NUMBER,
   FOREIGN KEY (dept_id) REFERENCES dim_department(dept_id)
);

CREATE TABLE dim_patient_snowflake (
   patient_id NUMBER PRIMARY KEY,
   patient_name VARCHAR2(50),
   gender CHAR(1),
   location_id NUMBER,
   FOREIGN KEY (location_id) REFERENCES dim_location(location_id)
);

-- ====================================
-- STEP 3: CREATE FACT TABLE
-- ====================================
CREATE TABLE fact_visits (
   visit_id NUMBER PRIMARY KEY,
   star_doctor_id NUMBER,
   star_patient_id NUMBER,
   snowflake_doctor_id NUMBER,
   snowflake_patient_id NUMBER,
   time_id NUMBER,
   charges NUMBER,
   FOREIGN KEY (star_doctor_id) REFERENCES dim_doctor(doctor_id),
   FOREIGN KEY (star_patient_id) REFERENCES dim_patient(patient_id),
   FOREIGN KEY (snowflake_doctor_id) REFERENCES
dim_doctor_snowflake(doctor_id),
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   FOREIGN KEY (snowflake_patient_id) REFERENCES
dim_patient_snowflake(patient_id),
   FOREIGN KEY (time_id) REFERENCES dim_time(time_id)
);

-- ====================================
-- STEP 4: INSERT SAMPLE DATA
-- ====================================

-- Departments
INSERT INTO dim_department VALUES (seq_dept.NEXTVAL, 'Cardiology');
INSERT INTO dim_department VALUES (seq_dept.NEXTVAL, 'Neurology');
INSERT INTO dim_department VALUES (seq_dept.NEXTVAL, 'Orthopedics');
INSERT INTO dim_department VALUES (seq_dept.NEXTVAL, 'Dermatology');
INSERT INTO dim_department VALUES (seq_dept.NEXTVAL, 'Pediatrics');

-- Locations
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'New York', 'NY');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Los Angeles', 'CA');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Chicago', 'IL');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Houston', 'TX');
INSERT INTO dim_location VALUES (seq_location.NEXTVAL, 'Miami', 'FL');

-- Doctors (Star)
INSERT INTO dim_doctor VALUES (seq_doctor.NEXTVAL, 'Dr. Smith',
'Cardiology', 'Heart Specialist');
INSERT INTO dim_doctor VALUES (seq_doctor.NEXTVAL, 'Dr. Jane', 'Neurology',
'Brain Surgeon');
INSERT INTO dim_doctor VALUES (seq_doctor.NEXTVAL, 'Dr. Allen',
'Orthopedics', 'Bone Specialist');
INSERT INTO dim_doctor VALUES (seq_doctor.NEXTVAL, 'Dr. Rose',
'Dermatology', 'Skin Specialist');
INSERT INTO dim_doctor VALUES (seq_doctor.NEXTVAL, 'Dr. Patel', 'Pediatrics',
'Child Doctor');

-- Patients (Star)
INSERT INTO dim_patient VALUES (seq_patient.NEXTVAL, 'Alice', 'F', 'New
York');
INSERT INTO dim_patient VALUES (seq_patient.NEXTVAL, 'Bob', 'M', 'Los
Angeles');
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INSERT INTO dim_patient VALUES (seq_patient.NEXTVAL, 'Charlie', 'M',
'Chicago');
INSERT INTO dim_patient VALUES (seq_patient.NEXTVAL, 'Diana', 'F',
'Houston');
INSERT INTO dim_patient VALUES (seq_patient.NEXTVAL, 'Eva', 'F', 'Miami');

-- Doctors (Snowflake)
INSERT INTO dim_doctor_snowflake VALUES (seq_doc_snow.NEXTVAL, 'Dr.
Smith', 'Heart Specialist', 1);
INSERT INTO dim_doctor_snowflake VALUES (seq_doc_snow.NEXTVAL, 'Dr.
Jane', 'Brain Surgeon', 2);
INSERT INTO dim_doctor_snowflake VALUES (seq_doc_snow.NEXTVAL, 'Dr.
Allen', 'Bone Specialist', 3);
INSERT INTO dim_doctor_snowflake VALUES (seq_doc_snow.NEXTVAL, 'Dr.
Rose', 'Skin Specialist', 4);
INSERT INTO dim_doctor_snowflake VALUES (seq_doc_snow.NEXTVAL, 'Dr.
Patel', 'Child Doctor', 5);

-- Patients (Snowflake)
INSERT INTO dim_patient_snowflake VALUES (seq_pat_snow.NEXTVAL, 'Alice',
'F', 1);
INSERT INTO dim_patient_snowflake VALUES (seq_pat_snow.NEXTVAL, 'Bob',
'M', 2);
INSERT INTO dim_patient_snowflake VALUES (seq_pat_snow.NEXTVAL,
'Charlie', 'M', 3);
INSERT INTO dim_patient_snowflake VALUES (seq_pat_snow.NEXTVAL, 'Diana',
'F', 4);
INSERT INTO dim_patient_snowflake VALUES (seq_pat_snow.NEXTVAL, 'Eva',
'F', 5);

-- Time
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 12, 3, 1, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 15, 3, 1, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 10, 4, 2, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 20, 5, 2, 2023);
INSERT INTO dim_time VALUES (seq_time.NEXTVAL, 5, 6, 2, 2023);

-- Fact Table (Join star and snowflake keys manually)
INSERT INTO fact_visits VALUES (seq_fact.NEXTVAL, 1, 1, 1, 1, 1, 5000);
INSERT INTO fact_visits VALUES (seq_fact.NEXTVAL, 2, 2, 2, 2, 2, 6000);
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INSERT INTO fact_visits VALUES (seq_fact.NEXTVAL, 3, 3, 3, 3, 3, 4500);
INSERT INTO fact_visits VALUES (seq_fact.NEXTVAL, 4, 4, 4, 4, 4, 7000);
INSERT INTO fact_visits VALUES (seq_fact.NEXTVAL, 5, 5, 5, 5, 5, 8000);

-- ====================================
-- STEP 5: OLAP OPERATIONS
-- ====================================

-- 1. SLICE: Visits of Dr. Smith
SELECT f.visit_id, d.doctor_name, p.patient_name, f.charges
FROM fact_visits f
JOIN dim_doctor d ON f.star_doctor_id = d.doctor_id
JOIN dim_patient p ON f.star_patient_id = p.patient_id
WHERE d.doctor_name = 'Dr. Smith';

-- 2. DICE: Visits for Cardiology in New York
SELECT f.visit_id, ds.doctor_name, ps.patient_name, dl.city, f.charges
FROM fact_visits f
JOIN dim_doctor_snowflake ds ON f.snowflake_doctor_id = ds.doctor_id
JOIN dim_patient_snowflake ps ON f.snowflake_patient_id = ps.patient_id
JOIN dim_location dl ON ps.location_id = dl.location_id
JOIN dim_department dd ON ds.dept_id = dd.dept_id
WHERE dd.dept_name = 'Cardiology' AND dl.city = 'New York';

-- 3. DRILL-DOWN: Revenue Year → Month → Day
SELECT t.year, t.month, t.day, SUM(f.charges) AS daily_charges
FROM fact_visits f
JOIN dim_time t ON f.time_id = t.time_id
GROUP BY t.year, t.month, t.day
ORDER BY t.year, t.month, t.day;

-- 4. ROLL-UP: Revenue Month → Year
SELECT t.year, t.month, SUM(f.charges) AS monthly_charges
FROM fact_visits f
JOIN dim_time t ON f.time_id = t.time_id
GROUP BY t.year, t.month
ORDER BY t.year, t.month;

-- 5. PIVOT: Charges by Department and Gender (Star)
SELECT *
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FROM (
   SELECT d.department, p.gender, f.charges
   FROM fact_visits f
   JOIN dim_doctor d ON f.star_doctor_id = d.doctor_id
   JOIN dim_patient p ON f.star_patient_id = p.patient_id
)
PIVOT (
   SUM(charges) FOR gender IN ('M' AS Male, 'F' AS Female)
)
ORDER BY department;

-- ====================================
-- STEP 6: DISPLAY DATA FROM ALL TABLES
-- ====================================
SELECT * FROM dim_doctor;
SELECT * FROM dim_patient;
SELECT * FROM dim_time;
SELECT * FROM dim_department;
SELECT * FROM dim_location;
SELECT * FROM dim_doctor_snowflake;
SELECT * FROM dim_patient_snowflake;
SELECT * FROM fact_visits;
```