**Practice Lab: Data Modeling Review & Improvement**

**Objective**

Practice reviewing, validating, and enhancing a data model with ERDs, star schemas, grain and SCD checks, and physical schema mapping.

**Materials Provided**

* Sample ERD Diagram (with intentional issues)
* Star Schema Layout (fact and dimension tables)
* Logical data model description
* SQL scripts with incomplete physical schema

**Tasks**

**Task 1: Peer-Review ERD & Star Schema**

* Identify missing or incorrect primary and foreign keys
* Spot inconsistent naming or attribute types
* Detect improper normalization or snowflaking
* Highlight any degenerate or junk dimensions missing surrogate keys

**Deliverable:** Annotated ERD and star schema listing issues found

**Task 2: Define Grain & Validate SCD**

* Specify the grain for each fact table (e.g., transaction line, daily summary)
* Review dimension tables for appropriate SCD type (0, 1, 2, or 3)
* Suggest schema changes to implement SCD Type 2 where needed (add start\_date, end\_date, surrogate keys)

**Deliverable:** Grain & SCD audit report

**Task 3: Refactor the Model**

* Rename tables and columns to follow naming conventions
* Add missing surrogate keys to dimension tables
* Normalize or denormalize tables based on performance and usability
* Fix inconsistent data types or constraints

**Deliverable:** Updated ERD and star schema diagrams

**Task 4: Map Logical Model to Physical Schema**

* Write SQL DDL statements for creating tables
* Define primary and foreign keys with correct data types
* Add indexes and constraints to improve query performance
* Propose partitioning or clustering if applicable

**Deliverable:** SQL file with CREATE TABLE scripts

**Task 5: Apply Mini-Lab Fixes**

* Correct cardinality errors in relationships
* Adjust fact table granularity if misaligned
* Rename confusing attributes or tables
* Fix nullability and default values

**Deliverable:** Corrected ERD and revised physical schema scripts

**Submission**

* Annotated ERD and star schema with review comments
* Grain & SCD audit document
* Refactored ERD and schema diagrams
* Physical schema SQL scripts
* Brief reflection on key challenges and solutions