

LABORATORY 2 (100 points)

Lab Exercise: Data Modeling for a Restaurant

Objective

Design a comprehensive database schema for a restaurant by creating an ER diagram, converting it to an Object-Oriented Data Model (OODM), and implementing it as a Relational Model. Prepare a report detailing the design process and insights gained.

Tools:

- **For ER Diagrams:** Lucidchart, draw.io, or any ER diagramming tool of your choice.
- **For Class Diagrams:** Lucidchart, draw.io, or a UML modeling tool like StarUML.
- **For Relational Model & SQL:** Use any SQL environment (PostgreSQL) or an online SQL editor like *db-fiddle.com* or *SQLFiddle*

Instructions:

To document and demonstrate your work during the lab exercise, you are required to create a report that includes screenshots and explanations for each part of the exercise. This documentation will serve as evidence of your understanding and execution of the task, and will also be used for grading.

Email Subject: SE 2141 - Laboratory 2

Send to: laholleza@gmail.com

Part 1: Entity-Relationship Models

Task: Design an ER diagram for a restaurant system.

Scenario: Create a database design for a restaurant to manage data about dishes, ingredients, orders, and customers.

Instructions:

1. **Identify Entities:** List the key entities in the restaurant system, such as **Dishes, Ingredients, Orders, and Customers**. Define at least three attributes for each entity.
2. **Determine Relationships:** Identify how these entities are related. Specify the cardinality for each relationship (e.g., one-to-many, many-to-many).
3. **Draw ER Diagram:** Create an ER diagram including all identified entities, their attributes, and the relationships with cardinalities.

Part 2: Object-Oriented Data Models

Task: Convert the ER diagram to an Object-Oriented Data Model.

Instructions:

1. **Create Class Diagrams:** Based on the ER model, define classes for each entity. Include relevant attributes and methods for each class.
2. **Specify Relationships:** Illustrate how the relationships from the ER model map to the OODM. Define associations between classes.
3. **Class Interactions:** Ensure that the class diagram shows how system components interact through the relationships.

Part 3: Relational Data Models

Task: Implement the ER diagram in a relational database.

Instructions:

1. **Create SQL Table Definitions:** Write SQL scripts to create tables based on the entities from Part 1. Define primary keys and foreign keys.
2. **Set Up Associative Tables:** Create tables for many-to-many relationships if applicable.
3. **Insert Sample Data:** Populate the tables with sample data to test the schema.
4. **Write SQL Queries:** Write and execute SQL queries to retrieve data based on specific conditions (e.g., list all dishes in a specific order).

*** If you use SQL Fiddle or other tools, you can simply take a screenshot of the query and its result.*

Part 4: Report

Task: Create a report summarizing your work.

Basis for Grading:

Part 1: Entity-Relationship Models (25 points)

Part 2: Object-Oriented Data Models(25 points)

Part 3: Relational Data Models(40 points)

Part 4: Report (10 points)

Take Note:

1. Points will be deducted for not following instructions.
2. As with the other laboratory exercises, the first submission will be the one that is accepted. Be sure to double-check that you have attached all the necessary files. Late submissions will receive a **score of 0**, so whether finished or unfinished, you must wrap up and submit your output.

Deadline: September 29, 2024 23:50:00