Software Engineering – TP Report

Object-Oriented Modeling Using UML

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Module: Software Engineering

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Introduction

This report presents four exercises in software engineering, focusing on the modeling of real-world systems using the Unified Modeling Language (UML). Each exercise includes a class diagram that defines the main entities, their attributes, and relationships.

1. Exercise 1: Library Management System

1.1. Library

Description

This diagram models a simple library system that manages books, members, and loan records. It illustrates how a library contains multiple books, members can borrow them, and a record keeps track of borrow and return dates.

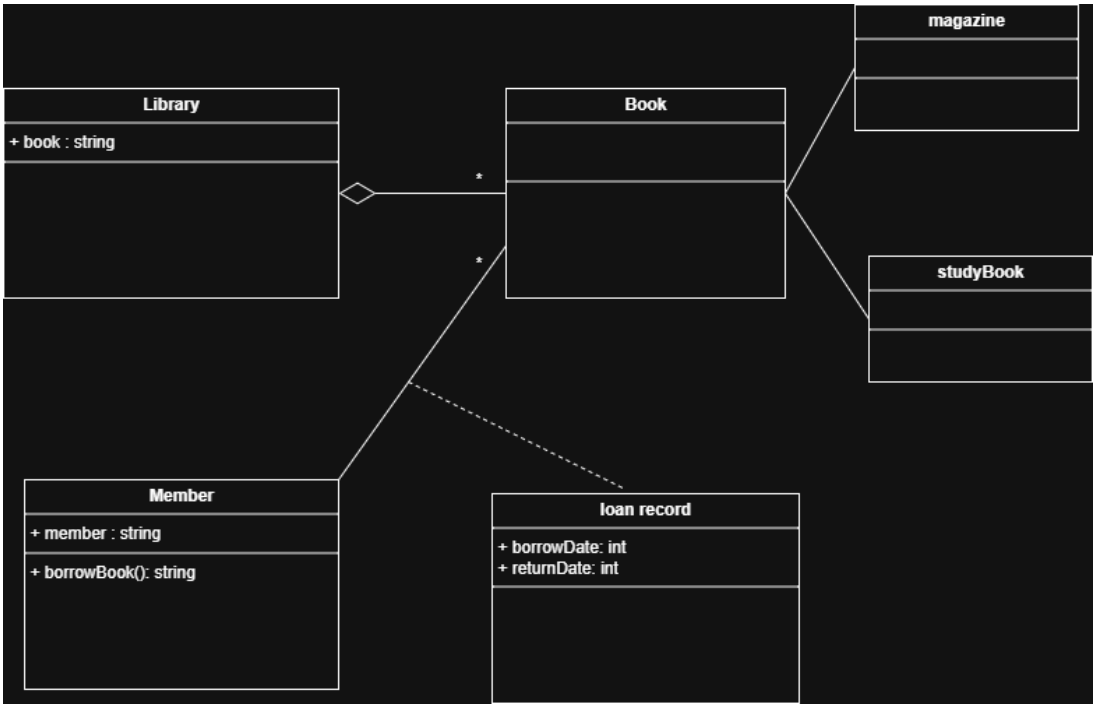

Figure 1.1: Library Management UML Diagram

1.2. Laptops

Description

This model represents a laptop management system. It defines the relationships between laptops, keyboards, and owners. Each laptop includes a keyboard composed of keys, has

a purchase price, and may optionally belong to an owner identified by their name and first name.

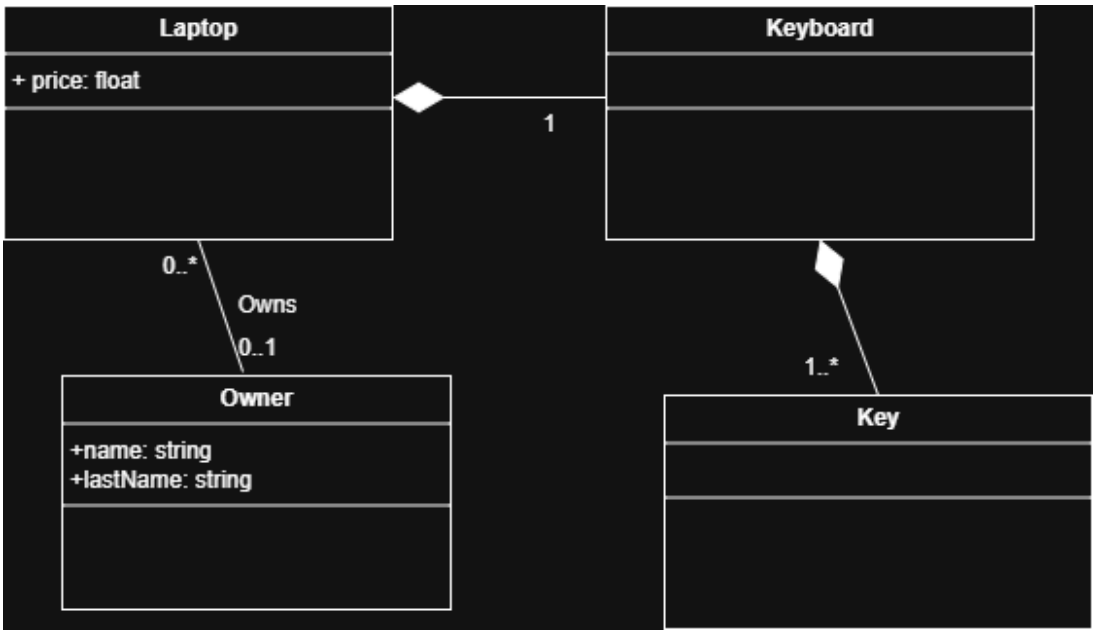

Figure 1.2: Laptop UML Diagram

2. Exercise 2: College Information System

Description

This model represents the organizational structure of a college, including departments, teachers, students, and subjects. It defines teaching relationships, course assignments, and grading.

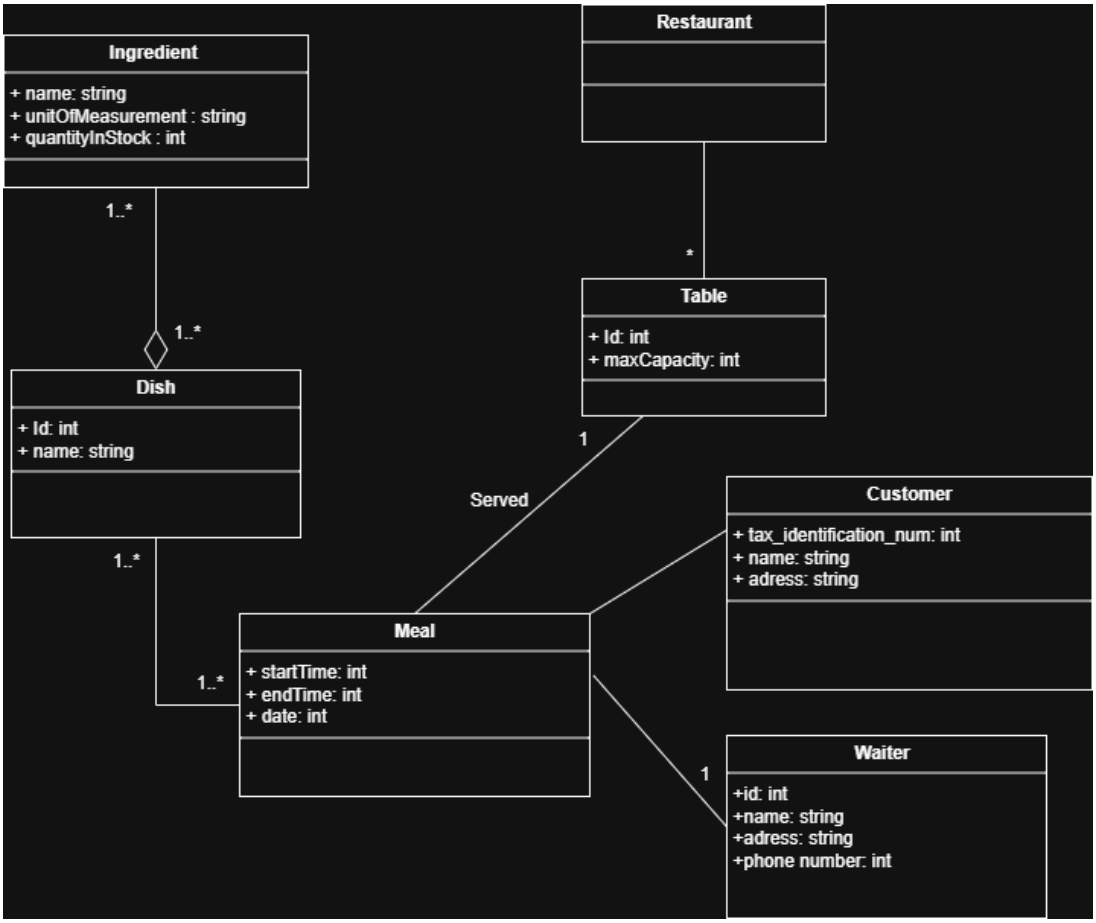

Figure 2.1: College UML Class Diagram

3. Exercise 3: Restaurant Management System

Description

This UML diagram models the interactions within a restaurant environment. It shows how tables, meals, customers, and waiters interact to deliver service.

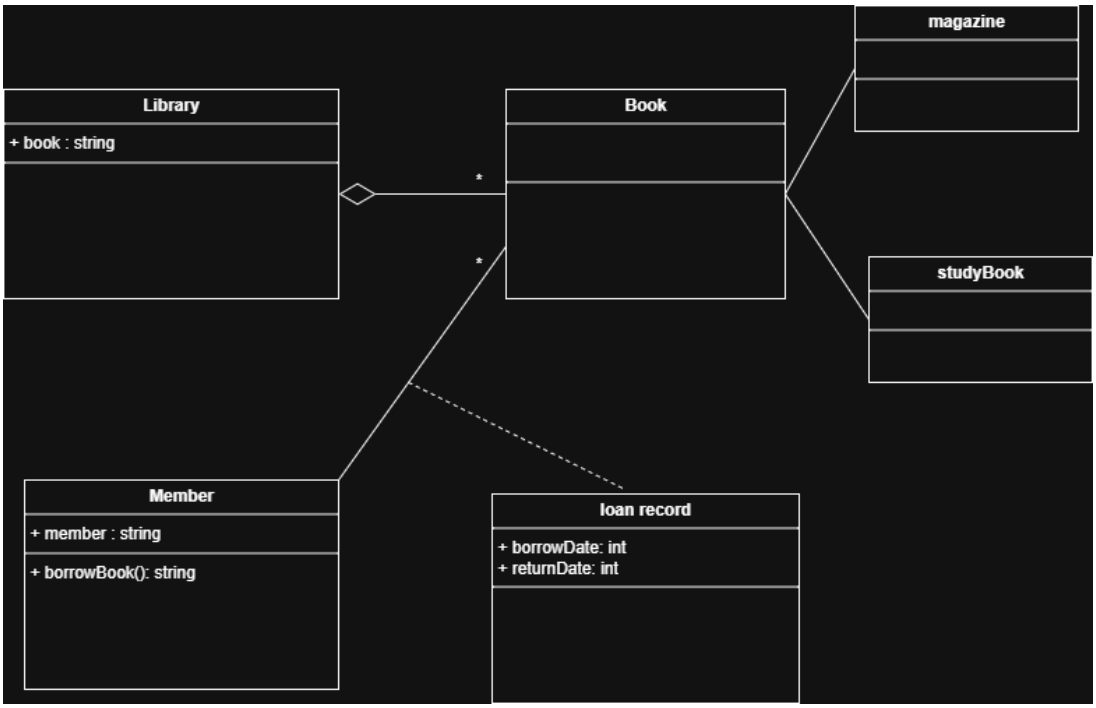

Figure 3.1: Restaurant Management UML Diagram

4. Exercise 4: Airport Management

Description

This model represents a flight reservation system managed by a travel agency. It defines the relationships between airlines, flights, passengers, and reservations, including flight schedules, airports, and possible stopovers.

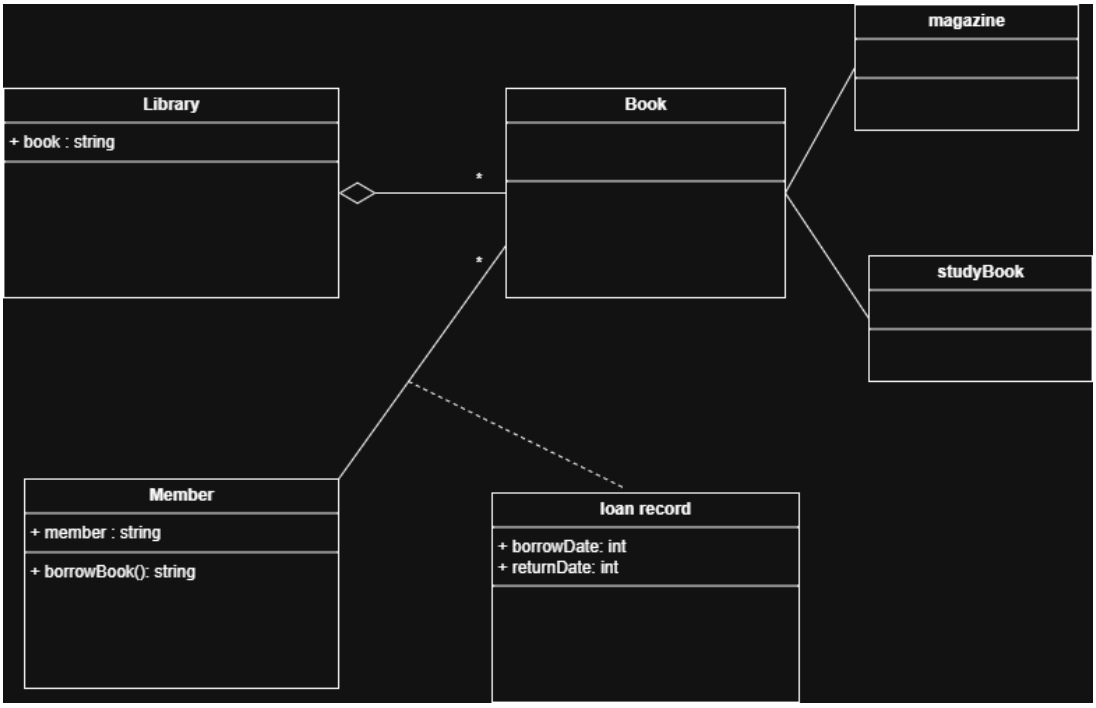

Figure 4.1: Airport Management UML Diagram

Conclusion

These exercises demonstrate the essential principles of object-oriented modeling and UML representation. Each diagram captures a specific domain library, laptop, academic, restaurant and airport systems. Through this, we deduce the importance of "Oriented Object Modeling and Programming".