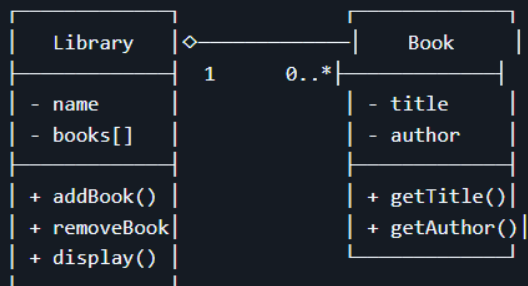


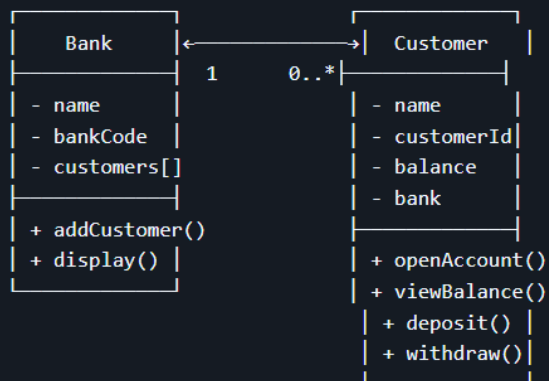
Problem 1: Library and Books (Aggregation)



Relationship: Aggregation

- Books can exist without libraries
- Same book can be in multiple libraries
- Library "has" books but doesn't own them

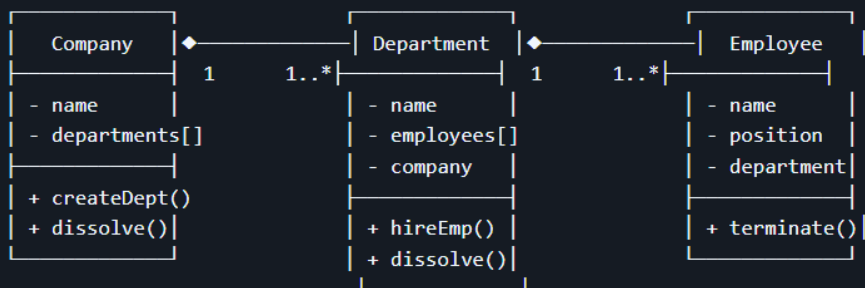
Problem 2: Bank and Account Holders (Association)



Relationship: Association

- Customers and banks exist independently
- Bidirectional relationship
- Communication through methods

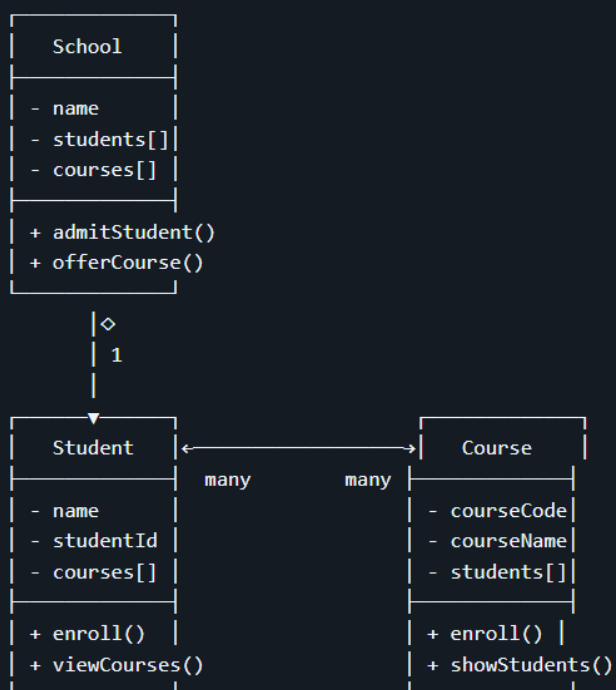
Problem 3: Company and Departments (Composition)



Relationship: Composition

- Departments cannot exist without company
- Employees cannot exist without department
- When company is deleted, all parts are deleted

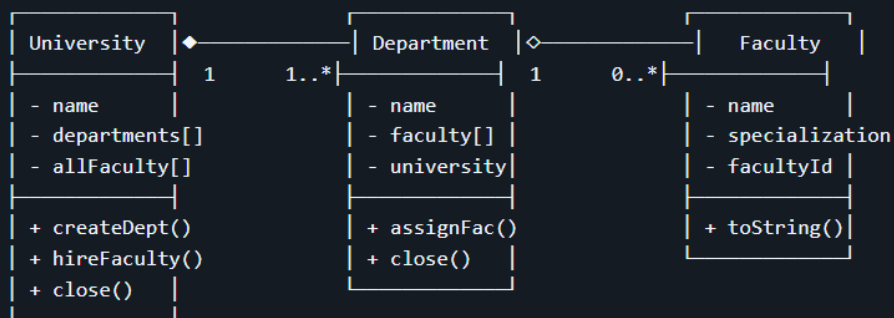
Self Problem 1: School, Students, and Courses



Relationships:

- School \diamond Student: Aggregation (students can exist without school)
- Student \leftrightarrow Course: Many-to-many Association

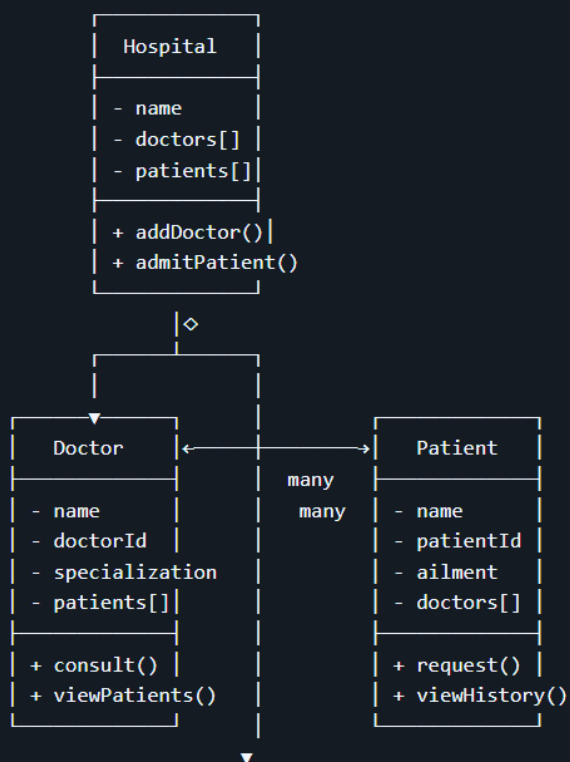
Self Problem 2: University, Faculties, and Departments



Relationships:

- University \blacklozenge Department: Composition (departments die with university)
- Department \lozenge Faculty: Aggregation (faculty can exist independently)
- University hires faculty, departments assign them

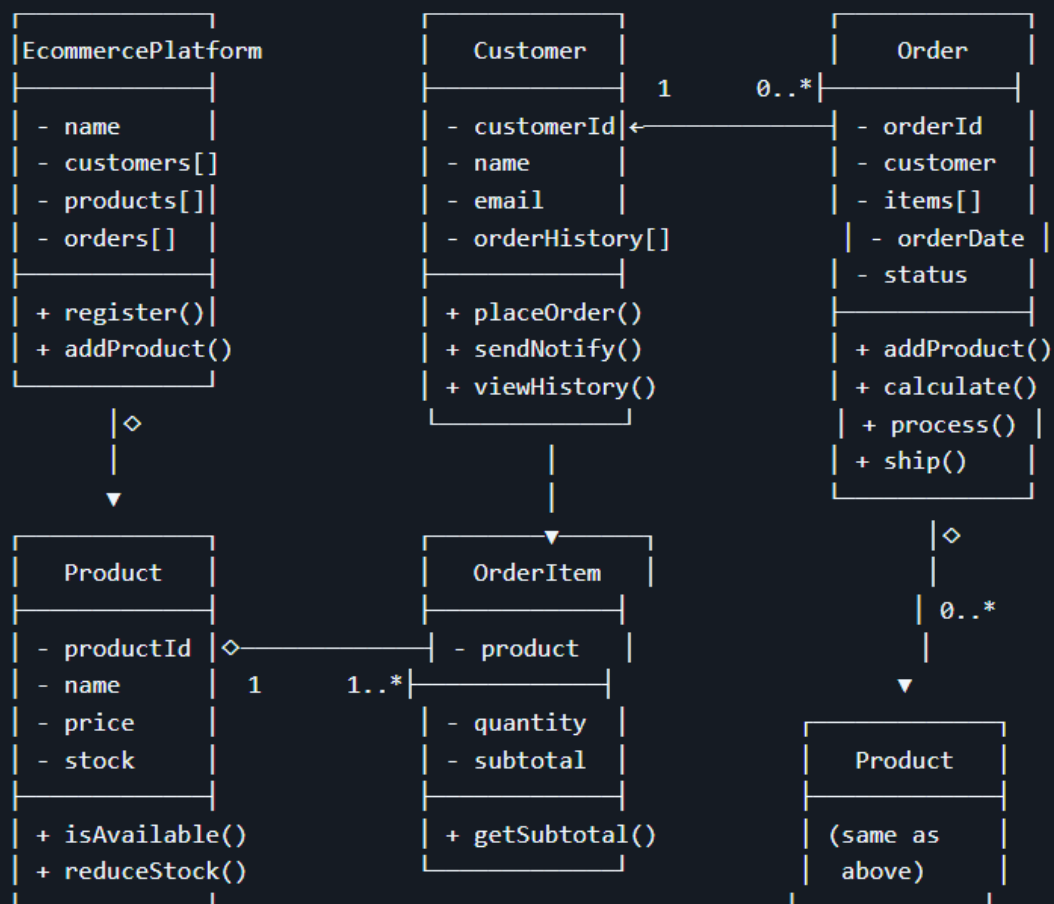
Self Problem 3: Hospital, Doctors, and Patients

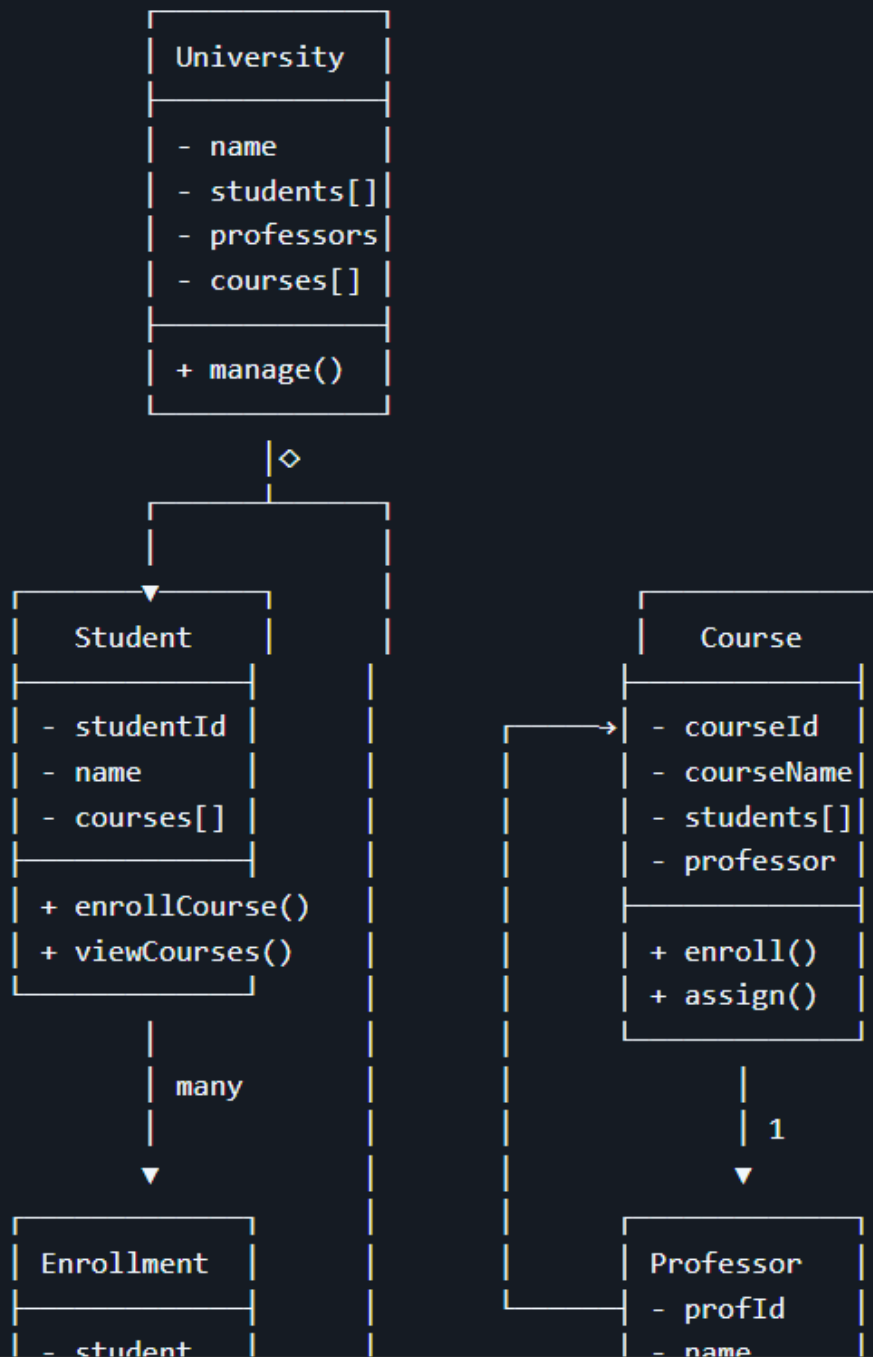


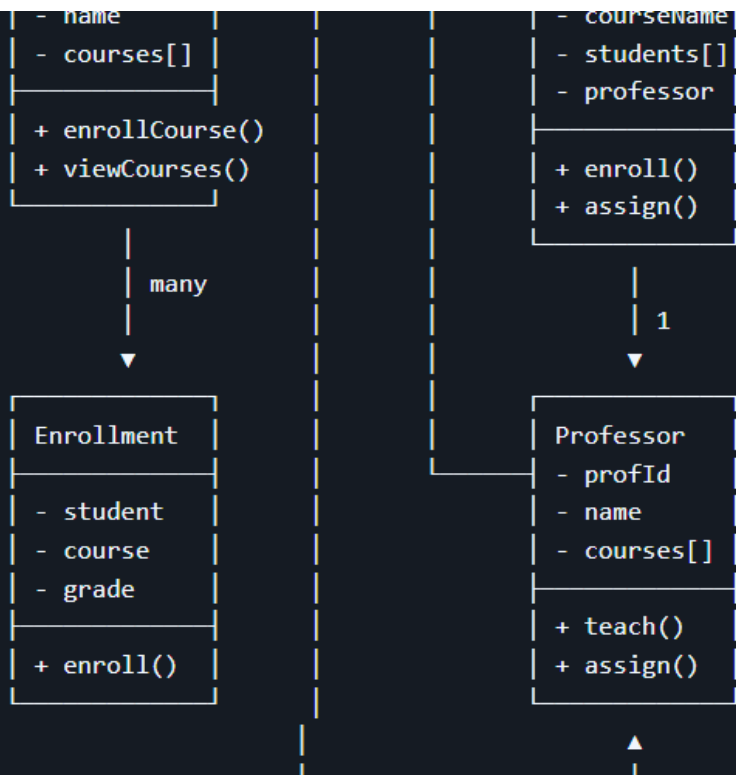
Communication Flow:

Patient → requestConsultation()

Self Problem 4: E-commerce Platform







Relationships:

- University \diamond Student/Professor/Course: Aggregation
- Student \leftrightarrow Course: Many-to-many through Enrollment
- Professor \rightarrow Course: One-to-many Association
- Communication: `enrollCourse()`, `assignProfessor()` methods

Relationship Summary

Problem	Primary Relationship	Key Characteristics
Library-Books	Aggregation	Books exist independently, can be shared
Bank-Customer	Association	Bidirectional, independent existence
Company-Department	Composition	Strong ownership, lifecycle dependency
School-Student-Course	Mixed	Aggregation + Many-to-many Association
University-Faculty-Dept	Mixed	Composition + Aggregation
Hospital-Doctor-Patient	Association	Many-to-many with communication
E-commerce	Mixed	Customer-Order + Order-Product relationships
University Management	Association	Complex many-to-many relationships

Legend

- ◇ Aggregation (hollow diamond)
- ◆ Composition (filled diamond)
- → Association (arrow)
- ↔ Bidirectional Association