Each problem below includes an example with Java code and an exercise task for students to complete.

1. Association - Customer and Address

Exercise Task:

• Implement a method updateAddress(String newStreet, String newCity, String newZipCode) in the Address class.

• Modify the Customer class to allow updating the address dynamically.

2. Aggregation - Library and Books

Exercise Task:

• Implement a method removeBook(String title) in Library.

• Test adding, removing, and displaying books.

3. Composition - Car and Engine

Exercise Task:

• Implement a method updateEngine(String newType, int newHorsepower) to update the engine details.

4. One-to-Many Association - Department and Employees

Exercise Task:

• Implement a method removeEmployee(String employeeName).

• Test adding, removing, and displaying employees.

5. Many-to-Many Association - Students and Courses

Exercise Task:

• Implement a method removeCourse(String courseName) for students.

• Test enrolling and removing students from courses.

6. Static Variables - Tracking Total Employees

Exercise Task:

• Implement getTotalSalary() static method to track total salaries.

7. Static Methods - Math Utility Class

Exercise Task:

• Implement factorial(int n) as a static method.

8. Final Variables - Immutable Bank Name

Exercise Task:

• Implement a withdraw(double amount) method.

9. Static Block - Database Configuration

Exercise Task:

• Add a second static block to modify one configuration setting.

10. Instance vs Static Methods - Bank Account Transactions

Exercise Task:

• Implement a withdraw(double amount) method.

• Test deposits and withdrawals.