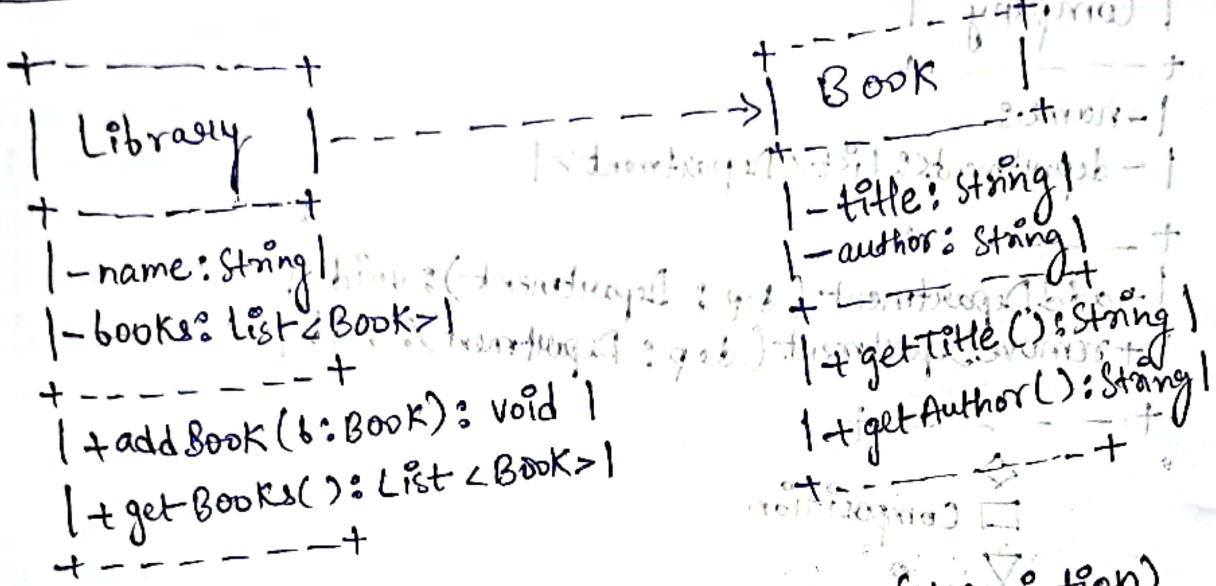
Shreya Goyal
J-36

Assisted Problems

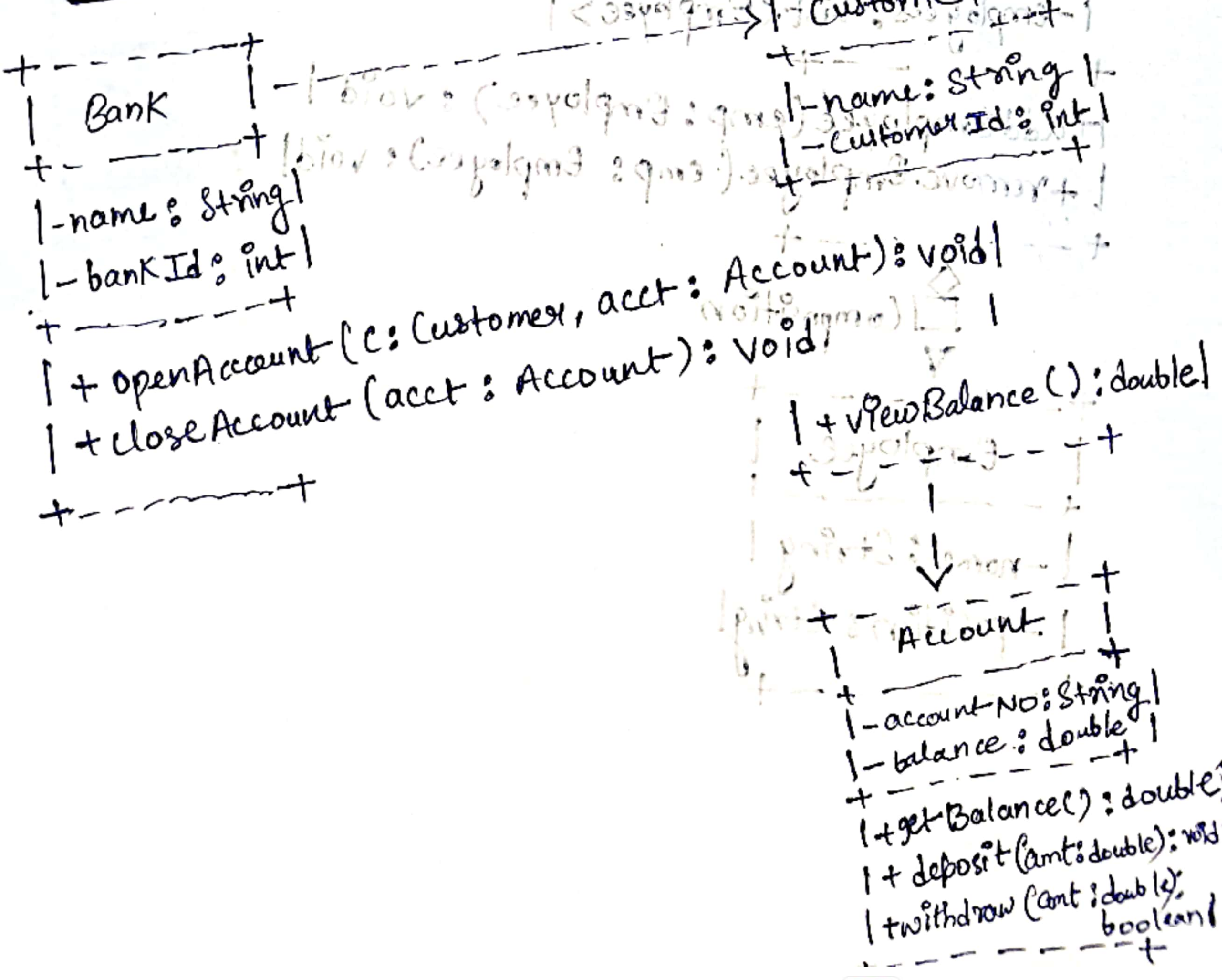
Problem 1 : Library and Books (Aggregation)

Class Diagram



Problem 2 : Bank and Account Holders (Association)

Class Diagram



Problem 3: Company & Departments (composition)

Class Diagram

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```
+-------------+
| Company     |
+-------------+
|-name:
|-departments: List<Department>|
+-------------+
|+addDepartment(dep: Department): void |
|+removeDepartment(dep: Department): void |
+-------------+
      ◇
      □ Composition
      ▽
+-------------+
| Department  |
+-------------+
|-name: String |
|-employees: List<Employee>|
+-------------+
|+addEmployee(emp: Employee): void |
|+removeEmployee(emp: Employee): void|
+-------------+
      ◇
      □ Composition
      ▽
+-------------+
| Employee    |
+-------------+
|-name: String |
|-position: String|
+-------------+
```

Self-Problems

Problem 1: School & Students with Courses (Association and Aggregation)

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Class Diagram

```
+-------+
| School |
+-------+
|-name: String|
|-students: List<Student>|
+--------+
|+addStudent(student : Student): void|
|+removeStudent(student: Student): void|
+--------+
     ◇
     ▽
+--------+
| Student |
+--------+
|-name: String|
|-id : String |
|-courses: List<Course>|
+--------+
|+enroll(course: Course): void|
|+ viewCourses (): List< Course>|
+--------+
     ↔ Association (many-to-many)
+--------+
| Course |
+--------+
|- title : String|
|- code: String|
|-students: List<Student>|
+--------+
|+addStudent (student: Student): void |
|+viewStudents () : List<Student>|
+--------+
```

Problem 2 : University with Faculties & Departments (Composition and Aggregation)

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Class Diagram

```
+--------+
| University |
+--------+
|-name: String
|-departments: List<Department>|
|-faculty: List<Faculty>
+------+
| +addDepartment(dept : Department): void |
| +addFaculty(faculty : Faculty): void |
+-------+
      □ Composition
      ▽
+-------+
| Department|
+-------+
|-name: String|
+-------+
      ◇ Aggregation
      ▽
+------+
| Faculty |
+------+
|-name : String|
|-title : String |
+-------+
```

Problem 3: Hospital, Doctors, and Patients (Association and Communication)

Class Diagram

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```
+----------+
| Hospital |
+----------+
|-name : String|
|-doctors: List<Doctor>|
|-patients: List<Patient>|
+----------+
| +addDoctor(doc: Doctor): void |
|+addPatient(pat: Patient): void|
+----------+

+----------+
| Doctor   |
+----------+
|-name : String|
|-specialty: string|
|-patients: List<Patient>|
+----------+
|+Consult(patient: Patient): void|
+----------+
      <-> Association (many-to-many)
+----------+
| Patient  |
+----------+
|-name: String|
|-age: int     |
|-doctors: List<Doctor>|
+----------+
```

Problem 4 : E-Commerce Platform with Orders, Customers and Products

Class Diagram

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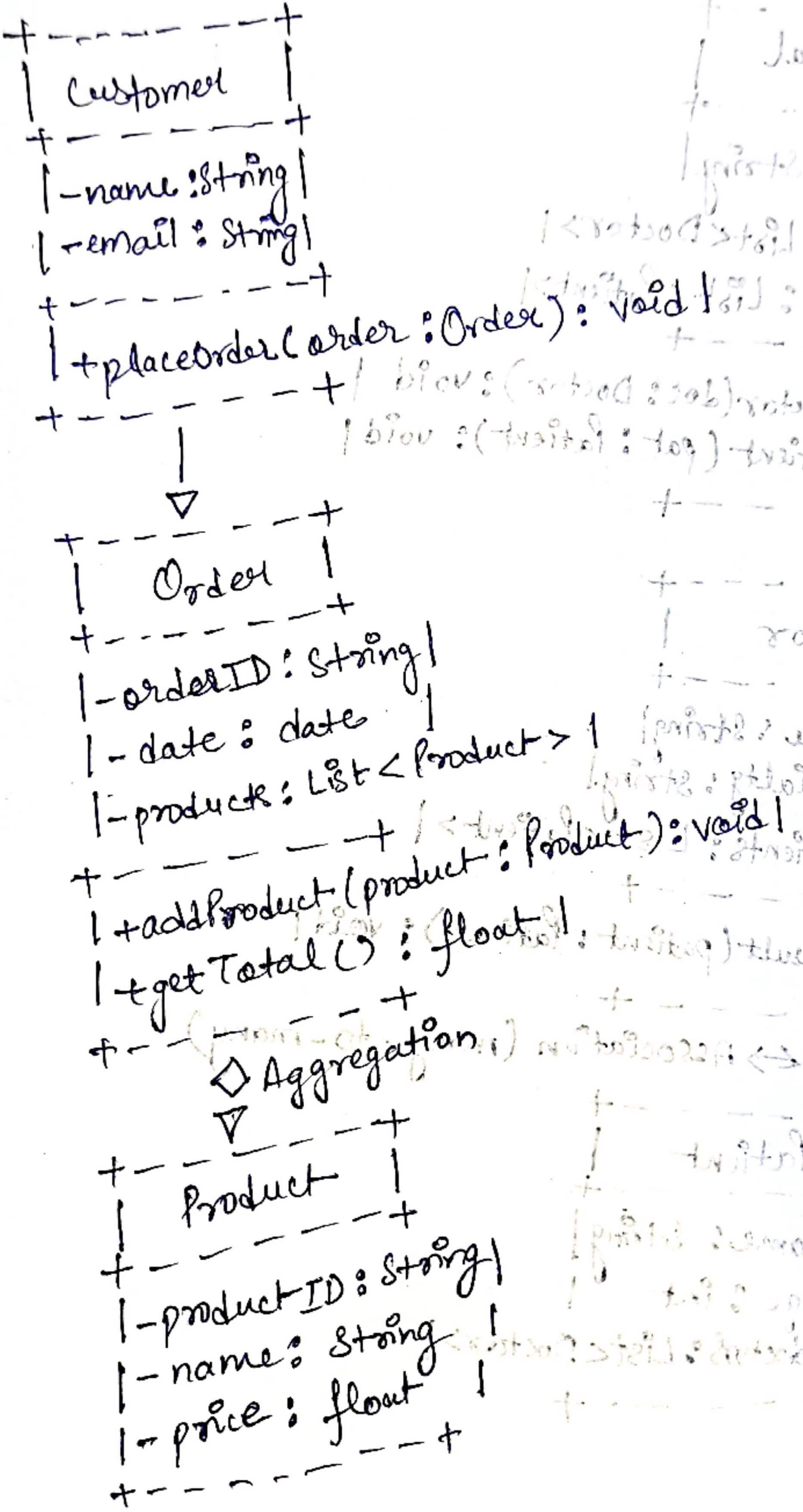

Customer

-name : String
-email : String

+placeOrder(order : Order) : void

Order

-orderID : String
-date : date
-products : List<Product>

+addProduct(product : Product) : void
+getTotal() : float

Product

-productID : String
-name : String
-price : float

Problem 5: University Management System

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Class Diagram

```
+-------+
| Student |
+------+
|-studentID: String|
|-name: String     |
|-courses: List<Course>|
+-----+
|+enrollCourse(course: Course): void|
|+viewCourse(): List<Course>        |
+------+
     ↔ Association (many-to-many)

+------+
| Course |
+-----+
|-courseID: String|
|-title: String   |
|-professor: Professor|
|-students: List<Student>|
+-------+
     ◇ Aggregation
     ▽
+-------+
| Professor |
+------+
|-professorID: String|
|-name: String       |
|-courses: List<Course>|
+------+
|+assignCourse(course: Course): void|
|+viewCourse(): List<Course>        |
+-------+
```