Assignment 8

Task 1: Inheritance Basics (Super Constructor Call)

Create a `Person` class with:

- `name` (String)
- `age` (int)
- A **constructor** to initialize them

A method `introduce()` that prints:
Hi, my name is {name} and I am {age} years old.

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Then, create a `Student` class that **inherits** from `Person` and adds:

- `grade` (String)
- A constructor that **calls** `super` to initialize `name` and `age`

A method `showStudentDetails()` that prints:
Name: {name}, Age: {age}, Grade: {grade}

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✅ **Create a student object and call `introduce()` and `showStudentDetails()`.**

Task 2: Superclass & Subclass Methods

Create an `Employee` class with:

- `name` (String)
- `salary` (double)

A method `showEmployeeDetails()` that prints:
Employee Name: {name}, Salary: {salary}

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Then, create a `Manager` class that **inherits** from `Employee` and adds:

- `teamSize` (int)
- A method `showManagerDetails()` that prints both employee details **and** the team size

✅ **Create a manager object and call `showEmployeeDetails()` and `showManagerDetails()`.**

Task 3: Encapsulation with Inheritance

Create a `BankAccount` class with:

- A **private field** `_balance` (double)
- A constructor to initialize `_balance`
- `deposit(amount)`, `withdraw(amount)`, and `getBalance()` methods
- `withdraw()` should **prevent withdrawal if balance < 500**

Then, create a **ChildAccount** class that **inherits from `BankAccount`** and:

- **Adds a field** `guardianName` (String)
- **Adds a method** `showGuardian()` that prints the guardian's name ✅ **Create a child account, make transactions, and test withdrawal restrictions.**

Task 4: Processing a List of Objects

Create a `Vehicle` class with:

- `brand`
- `year`
- A method `showDetails()`

Then, create two subclasses:

- **`Car`** (extra field: `fuelType`)
- **`Motorcycle`** (extra field: `engineCapacity`)

✅ **Create a list of vehicles (both cars & motorcycles) and print their details.**

Task 5: Library System with Inheritance

Create a **`Book`** class with:

- `title`
- `author`
- `pages`

Create a **`EBook`** class that **inherits** from `Book` and:

- **Adds a field** `fileSize` (MB)
- A method `showEBookDetails()` that prints book details **and** file size

✅ **Create book & eBook objects and test `showEBookDetails()`.**