🖼️ Task Report

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Topic: Pillars of Java
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✅ Task Name:

Understanding and Documenting the Four Pillars of Java (OOP Concepts)

📌 Task Objective:

To study and understand the four main pillars of Object-Oriented Programming in Java and explain each with proper examples and real-world relevance.

📚 Pillars of Java - Description

1. **Abstraction**
   - **Description:**
     Abstraction is the concept of hiding the internal implementation and showing only the essential features of the object. It helps in reducing programming complexity.
   - **Java Example:**
     Using abstract classes or interfaces to define methods that are implemented by subclasses.
   - **Real-life Example:**
     Driving a car – you only need to know how to drive, not how the engine works.
2. **Encapsulation**
   - **Description:**
     Encapsulation is the process of wrapping data (variables) and code (methods) into a single unit known as a class. It helps in data hiding and security.
   - **Java Example:**
     Declaring variables as private and providing public getter/setter methods.
   - **Real-life Example:**
     A medical capsule – it hides the medicine inside the wrapper.
3. **Inheritance**

- o **Description:**
  Inheritance is the mechanism in Java by which one class can inherit properties and behavior (methods) from another class. It supports code reusability.
- o **Java Example:**
  Using `extends` keyword to create a child class from a parent class.
- o **Real-life Example:**
  A child inheriting characteristics from their parents.

4. **Polymorphism**
   - o **Description:**
     Polymorphism means "many forms". In Java, it allows methods to perform different tasks based on the object that is calling them.
   - o **Java Example:**
     Method Overloading and Method Overriding.
   - o **Real-life Example:**
     A person acting as a student in school, a daughter at home, and a friend outside – same person, different behaviors.