

Question 2 Object-Oriented Programming

Explain which OOP principles you applied in the previous exercise and what their purpose is.

Answer

Object-Oriented Programming (OOP) is based on four main principles: Encapsulation, Abstraction, Inheritance, and Polymorphism.

1. Encapsulation

Purpose:

- Protect the integrity of an object's data.
- Provide a controlled interface to the object's data.

Application:

In my application, encapsulation is achieved by defining fields in a class as private and providing public getter and setter methods.

2. Abstraction

Purpose:

- Simplify complex systems by hiding unnecessary details.
- Provide a clear and simple interface.

Application:

In my application, abstraction is implemented using interfaces. For example, creating a service layer interface for handling user requests to create new event, show all events etc

Also used Spring data jpa repository interface which abstracts the DAO layer

3. Inheritance

Purpose:

- Promote code reuse.
- Establish a natural hierarchy between classes.

Application:

In my application, inheritance is used in the Repository interface to extend the JpaRepository for utilizing common methods. For example, findAll() method implementation is provided by JpaRepository that is used by my EventRepository

4. Polymorphism

Purpose:

- Allow objects of different classes to be treated as objects of a common superclass.
- Provide flexibility and reusability in code.

Application:

In my application, polymorphism is applied through method overriding. For example: EventService.java two overridden methods.

```
public List<EventDTO> fetchEvents() throws DataAccessException;
```

```
public List<EventDTO> fetchEvents(String satelliteName) throws DataAccessException;
```

Please refer to codebase of backend SpringBoot Java Service -

https://github.com/StutiShrivastava/satellite_service