

Design Patterns

Design Patterns



Object-Oriented Design (OOD)

- A methodology that helps to organize complex software systems by visualizing them as a set of interacting objects, each of which is an instance of a particular class. It is a programming paradigm based on the concept of "objects", which can contain data and code: data in the form of fields (also known as attributes or properties), and code, in the form of procedures (also known as methods).
- Principles
 - Encapsulation
 - Inheritance
 - Polymorphism
 - Abstraction

Pattern

- In software programming, a pattern is a general repeatable solution to a commonly occurring problem.
- A design pattern isn't a finished design that can be transformed directly into code; it's a description or template for how to solve a problem that can be used in many different situations.

Design Principles

- General guidelines that can guide your class structure and relationships.
- Common sense rules.
- General guidelines
 - Core OOP principles (APIE)
 - Single responsibility
 - Open-closed
 - Loose coupling
 - Use composition rather than inheritance
 - In relationships prefer HAS-A to IS-A
 - Program to an interface, not an implementation
 - Encapsulate what varies
 - Identify the aspects of your application that vary and separate them from what stays the same.

Design Principles

- SOLID (Martin)
 - Single responsibility
 - Open/Closed
 - Liskov Sustitution
 - Interface Segregation
 - Dependency Inversion
- GRASP (General Responsibility Assignment Software Patterns)
 - Controller
 - Information Expert (or Expert)
 - Low Coupling
 - High Cohesion
 - Polymorphism
 - Pure Fabrication
 - Indirection
 - Protected Variations
 - Creator



Design Patterns

- Tried-and-true design solutions that have been found to solved specific problems.
- Experience (no code, no algorithm)
- Abstract
- General solution
- Specific design solutions
- Example: The Strategy Pattern.
 - Family of algorithms, that encapsulates each one, and makes them interchangeable.

Design Principles vs Design Patterns

- Good object oriented design.
- Creating flexible and extensible software that is maintainable.
- Principe --> Pattern

