

# **Design Pattern**

# Definition

- A pattern provides a good solution to a common problem in a given context.
- “a three-part rule which expresses a relation between a certain context, a problem, and a solution.”

# Patterns and architecture

- Helps to visualize , specify , construct and document the artifacts of a software intensive system.
- Two different patterns
  - **Design patterns** – specify the **structure and behavior** of a **society of classes**
  - **Architectural patterns** – specify the structure and behavior **of an entire system**.

# Kinds of Patterns

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- *Architectural patterns* describe broad-based design problems that are solved using a structural approach.
- *Data patterns* describe recurring data-oriented problems and the data modeling solutions that can be used to solve them.
- *Component patterns* (also referred to as *design patterns*) address problems associated with the development of subsystems and components, the manner in which they communicate with one another, and their placement within a larger architecture
- *Interface design patterns* describe common user interface problems and their solution with a system of forces that includes the specific characteristics of end-users.
- *WebApp patterns* address a problem set that is encountered when building WebApps and often incorporates many of the other patterns categories just mentioned.

# Kinds of Patterns

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- **Creational patterns** focus on the “creation, composition, and representation of objects, e.g.,
  - Abstract factory pattern: centralize decision of what factory to instantiate
  - Factory method pattern: centralize creation of an object of a specific type choosing one of several implementations
- **Structural patterns** focus on problems and solutions associated with how classes and objects are organized and integrated to build a larger structure, e.g.,
  - Adapter pattern: 'adapts' one interface for a class into one that a client expects
  - Aggregate pattern: a version of the Composite pattern with methods for aggregation of children
- **Behavioral patterns** address problems associated with the assignment of responsibility between objects and the manner in which communication is effected between objects, e.g.,
  - Chain of responsibility pattern: Command objects are handled or passed on to other objects by logic-containing processing objects
  - Command pattern: Command objects encapsulate an action and its parameters