Three Souces of a Solid Object-Oriented Design

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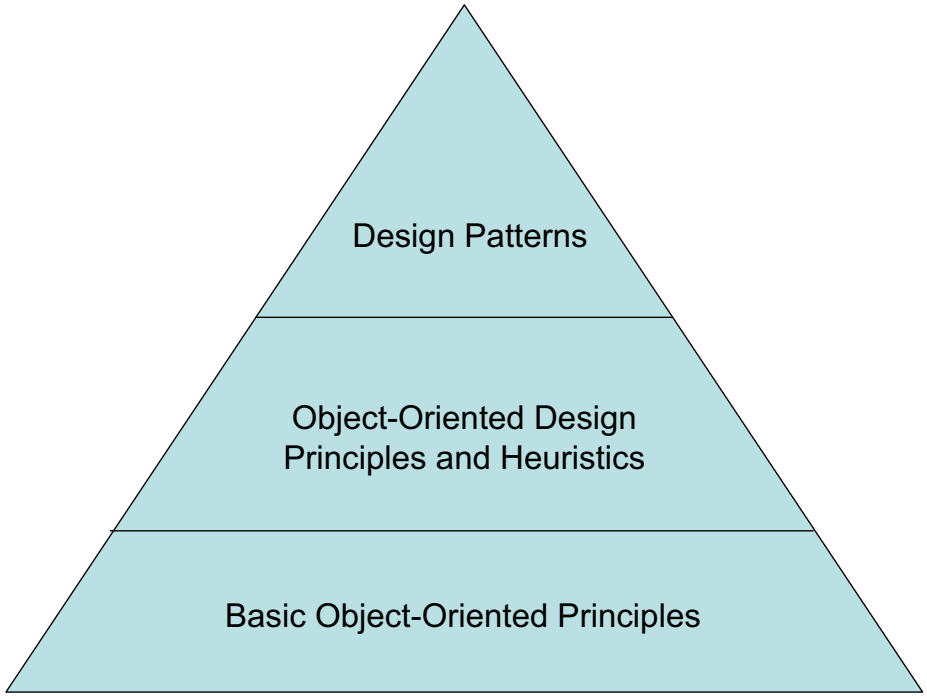

The OO Design Pyramid

To build contemporary real-world enterprise-class systems, OO designers should:

- be proficient in basic OO principles,
- master the principles and heuristics of OO design,
- understand design patterns.

We can think of OO design *principles* and *heuristics* as answers to the “**what”** question because they unfold what to do to achieve design harmony.

At the top level of the OO design pyramid, we find the most effective approaches to solving generic and specific problems in certain contexts. We can think of this level as the one answering the "**where**" question.

Basic OO Principles

- Abstraction
- Encapsulation,
- Inheritance,
- Polymorphism,
- Composition.

OO Design Principles and Heuristics

Define the most common scientifically derived approaches for building robust and flexible systems.

- Open/Closed Principle,
- Liskov Substitution Principle,
- Dependency Inversion Principle,
- …

Design Patterns

Design patterns represent common structured solutions to design problems solved in a particular context.

They are a guide to good design practices and span a wide range of solutions from general topics to specific themes.

Each pattern describes intent, motivation, applicability, structure, participants, collaborations, consequences, and implementation.

Pattern categories:

- Creational: Factory, Abstract Factory, ... ,
- Structural: Decorator, Facade, Adapter, … ,
- Behavioral: Strategy, Observer, State, … .