



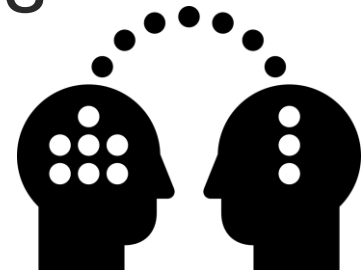
Design Patterns

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[Design Patterns]

- A design pattern is a general reusable solution to a common problem
- Patterns are known best practices
 - They allow reuse of knowledge from experts
- They do not describe a complete solution, since it is supposed to be reused in different applications



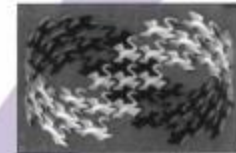
[The 23 GoF Patterns]

- The most well known design patterns are in a book from E. Gamma, R. Helm, R. Johnson, and J. Vlissides
 - They are known as Gang-of-Four (GoF)

Design Patterns

Elements of Reusable
Object-Oriented Software

Erich Gamma
Richard Helm
Ralph Johnson
John Vlissides



Foreword by Grady Booch

Padrões de Projeto

soluções Reutilizáveis de
Software Orientado a Objetos

ERICH GAMMA
RICHARD HELM
RALPH JOHNSON
JOHN VLISSIDES



Beyond the GoF Patterns

- Several new design patterns appear every year
 - There are patterns to address specific problems, such as interface, persistence, architecture, distribution, etc.
- Many books document patterns
 - Most of them are based on the 23 GoF design patterns

Design Pattern Classification

■ Purpose

- **Creational:** concerns the process of object creation
- **Structural:** deals with the composition of classes
- **Behavioral:** characterizes the ways classes or objects interact and distribute responsibility

■ Scope

- **Classes:** deal with relationships between classes and their subclasses
- **Objects:** deal with object relationships, which can be changed at run-time and are more dynamic

Design Pattern Documentation

- Name and classification
 - Also known as
- Motivation
- Applicability
- Structure
- Participants
- Collaborations
- Consequences
- Implementation
- Sample code
- Known uses
- Related Patterns

[Main Elements]

- Name
 - How the pattern is identified
- Problem Description
- Solution
 - It is a *template* of the solution and can be used in different applications
- Consequences
 - Results you get when you apply the pattern

[Bibliography]

- E. Gamma, R. Helm, R. Johnson, J. Vlissides. **Design Patterns**, 1st. Edition. Addison Wesley, 1994.
 - Chapter 1