



Tackling Design Patterns

Chapter 29: Flyweight Design Pattern

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29.1 Introduction

29.2 Programming Preliminaries

29.3 Flyweight Design Pattern

29.3.1 Identification

Name	Classification	Strategy
Flyweight	Object Structural	Delegation
Intent		
<i>“User sharing to support large numbers of fine-grained objects efficiently.”</i> ([1]:195)		

29.3.2 Problem

29.3.3 Structure

The structure of the Flyweight design pattern is given in Figure 1.

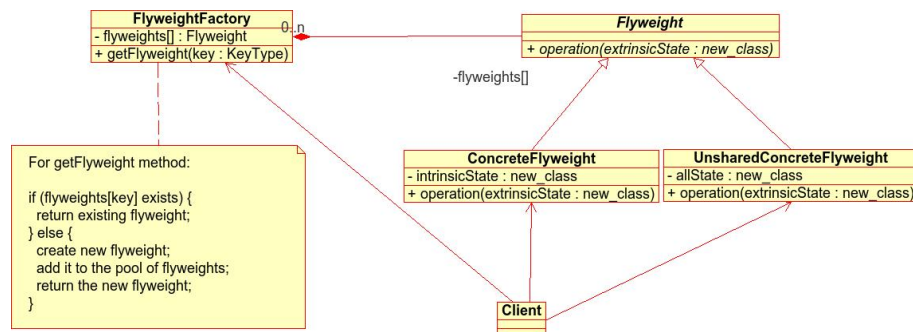


Figure 1: The structure of the Flyweight Design Pattern

Flyweights have both *intrinsic* and *extrinsic* state. Intrinsic state refers to the internal state of the flyweight and can be shared as it is independent of the context in which the flyweight is. For example: a flyweight may represent a letter. Extrinsic state refers to the context within the flyweight is and therefore cannot be shared. For example: flyweights are ordered in terms of the context to form words.

29.3.4 Participants

FlyweightFactory Creates an instance of a flyweight if it does not exist or supplies an existing one.

Flyweight Defines the interface through which flyweights are instantiated

ConcreteFlyweight Implements the interface and adds intrinsic (shareable) state storage.

UnsharedConcreteFlyweight Not all flyweights need to be shared. Therefore not all need to store intrinsic state. UnsharedConcreteFlyweights may have ConcreteFlyweights as children

29.4 Pre-knowledge

29.5 Flyweight Pattern Explained

29.5.1 Related Patterns

Composite In combination with flyweights, can be used to model directed-acyclic graphs.

States can be implemented as flyweights.

Strategies can also be implemented as flyweights.

29.6 Example

29.6.1 Balls

29.6.2 References

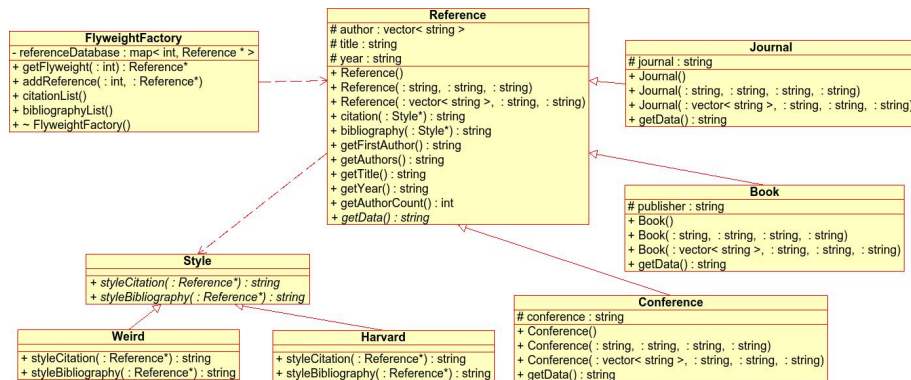


Figure 2: References example

Participants - Flyweight Design Pattern FlyweightFactory - FlyweightFactory Flyweight
 - Reference ConcreteFlyweight - Journal, Conference, Book ConcreteColleague - Student,
 Lecturer

Participants - Strategy Design Pattern Provides the Extrinsic state Context - Reference
 Strategy - Style ConcreteStrategy - Weird, Harvard

References

- [1] Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides. *Design patterns : elements of reusable object-oriented software*. Addison-Wesley, Reading, Mass, 1995.