



# 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		
“User sharing to support large numbers of fine-grained objects efficiently.” ([1]:195)		

### 29.3.2 Problem

### 29.3.3 Structure

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

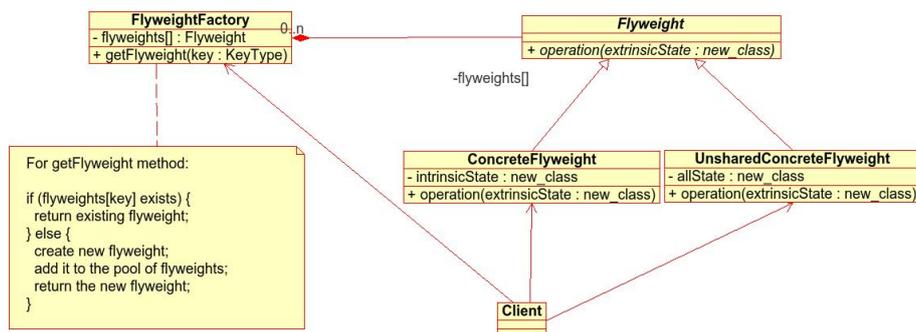


Figure 1: The structure of the Flyweight Design Pattern

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

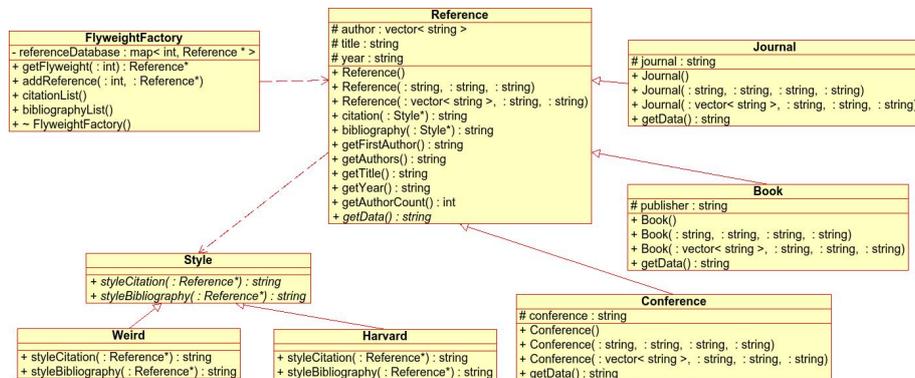


Figure 2: References example

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 - Weirid, 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.