

# The Flyweight

---

# Flyweight

**Reduces memory usage**

**Eliminates redundant object creation**

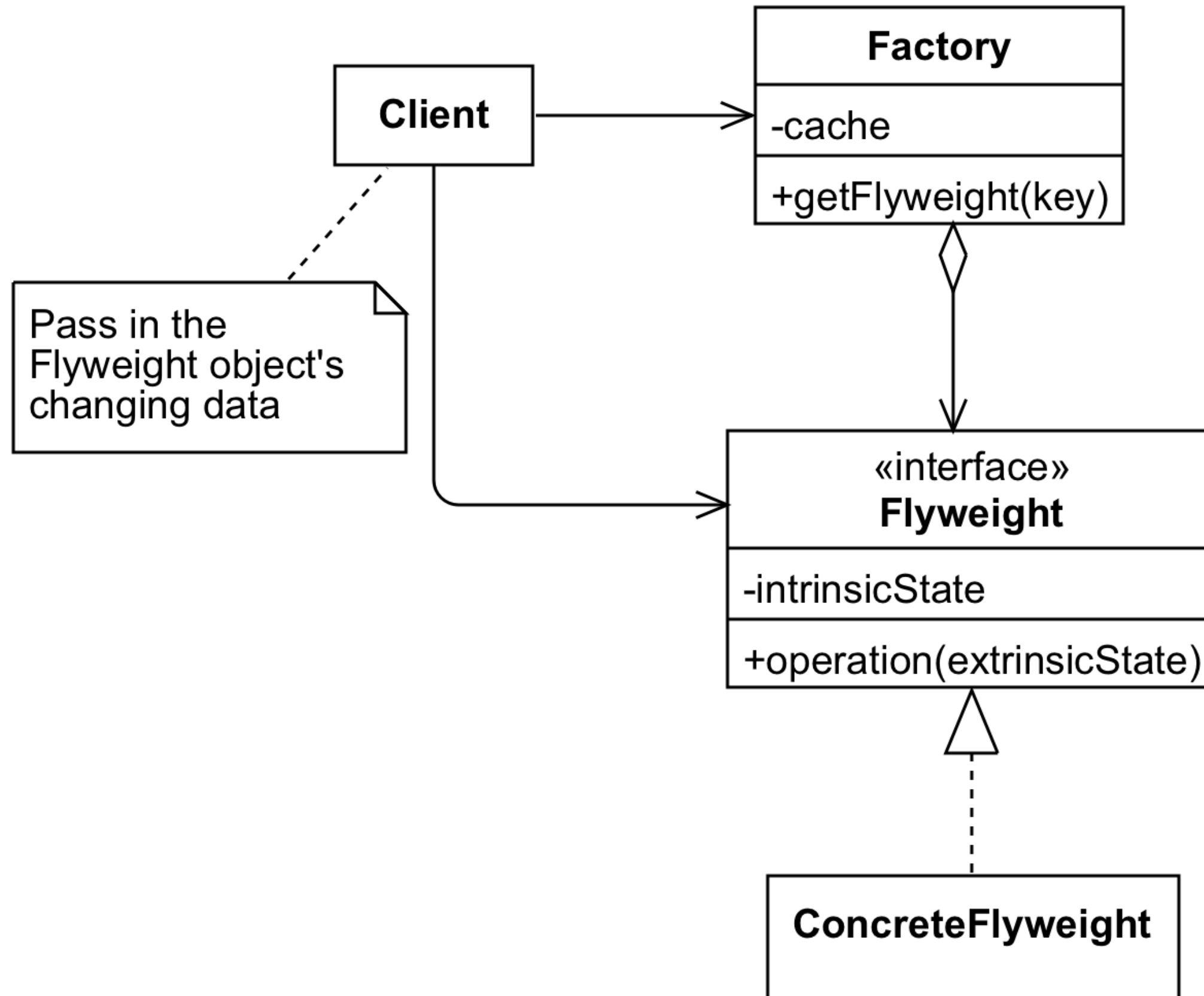
**Shares common data instead of recreating it**

# Intrinsic State

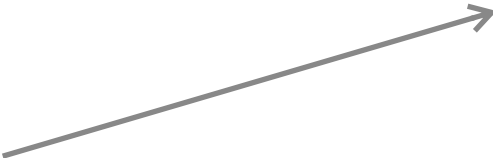
Permanent, immutable part of an object's state.

# Extrinsic State

The changing part of an object's state.

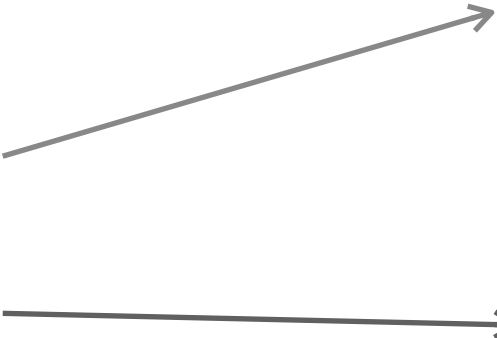


Character
-letter -size -color



K

Character
-letter -size -color

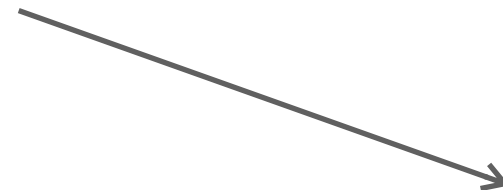
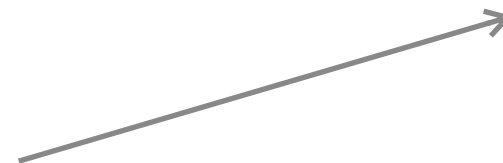


K



32

Character
-letter -size -color



K



32

K






- 200 pages, 1500 characters / page
- 300,000 character objects

Size

Color


Size


**K**  32

Color

**K**

Size

**K**  32


**K**  48


Color


K

K

Size

**K**  32

**K**  48

**K**  64

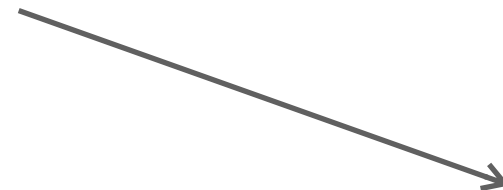
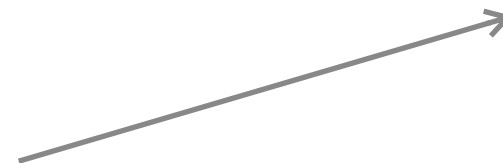
Color

K

K

K

Character
-letter -size -color

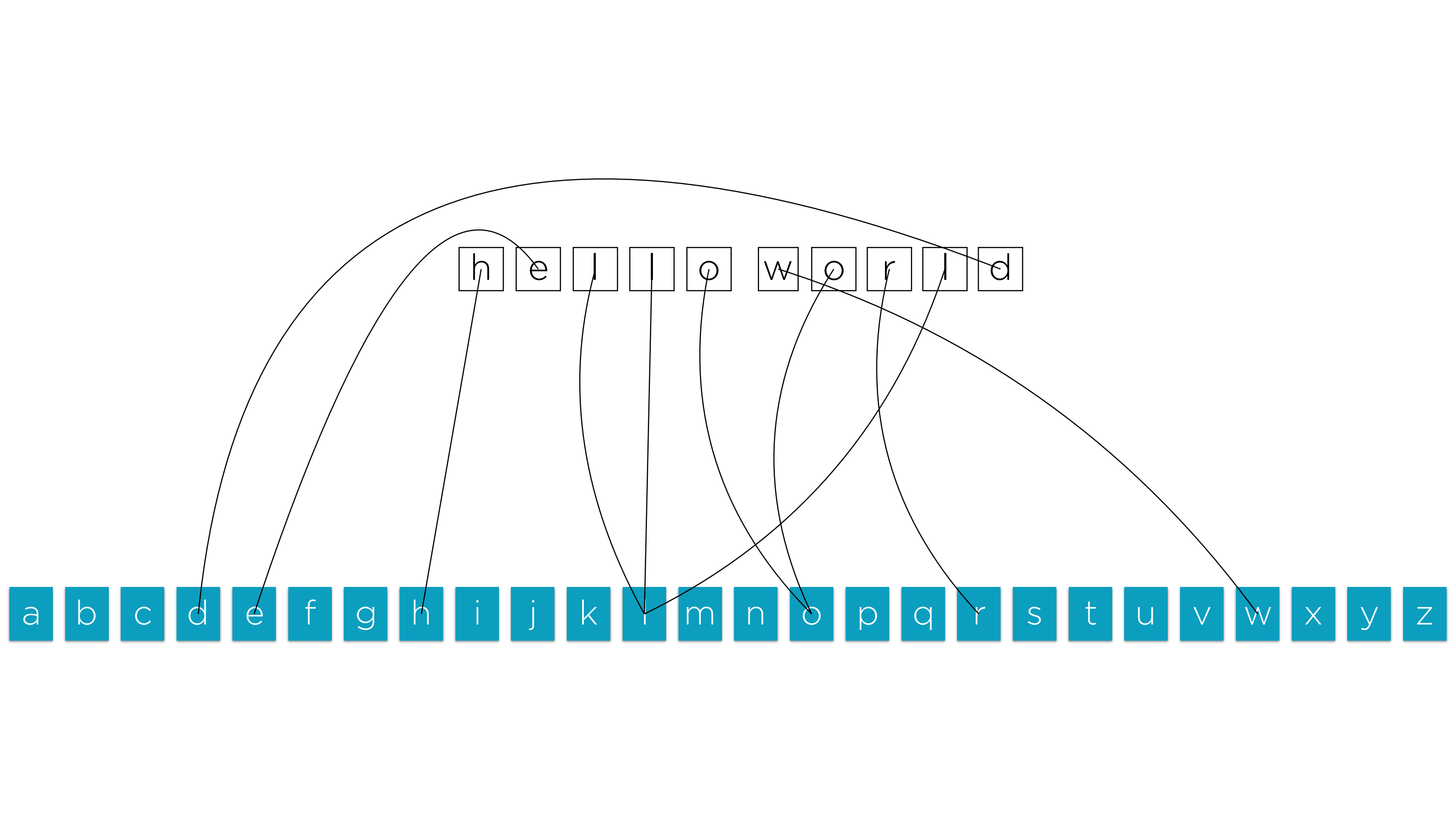


K

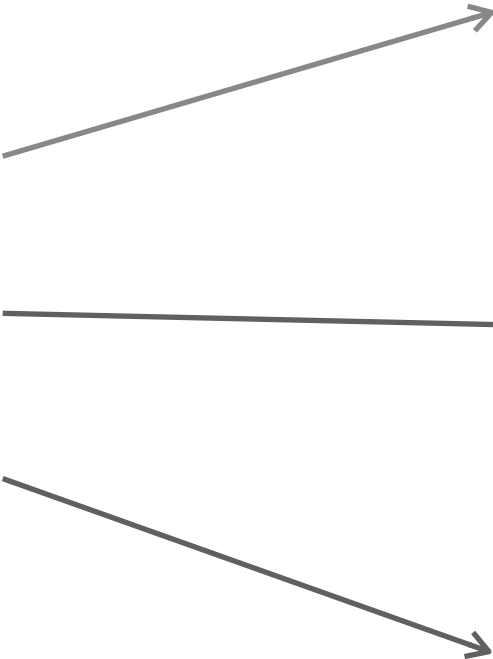


32

K



Character
-letter -size -color



K



32

k



. ? ! , ; : - — [ ] { } ( ) ‘ “ ” ...

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

. ? ! , ; : - — [ ] { } ( ) ‘ “ ” ...

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

. ? ! , ; : - — [ ] { } ( ) ‘ “ ” ...

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h  j k l m n o p q r s t u v w x y z

Fl\_yweighth\_t

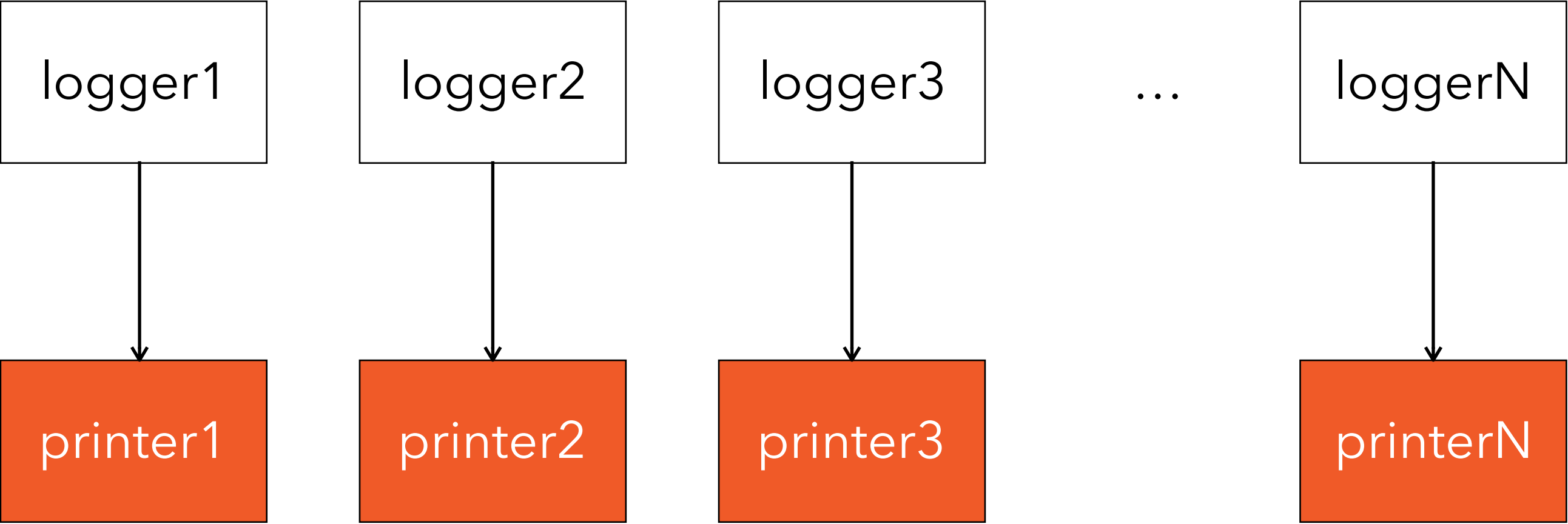
# Flyweight

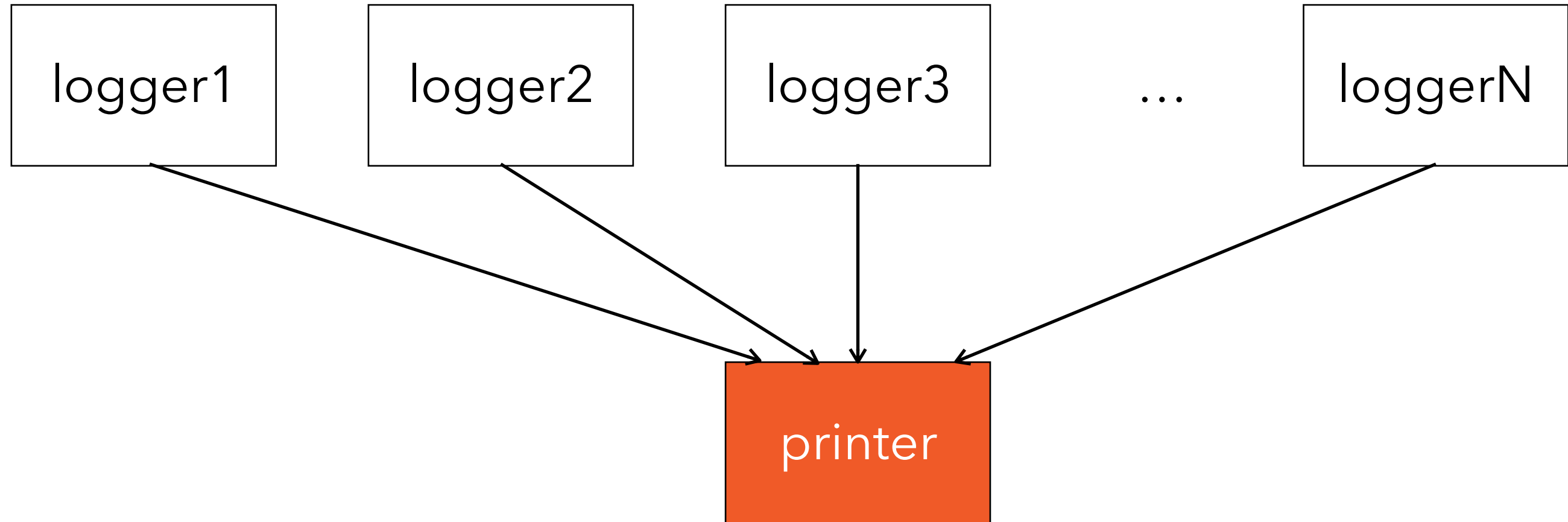
Reduces memory usage by sharing common objects across multiple contexts.

# Demo

## **Logger Framework**

- Naive approach







```
subsystem + category + printer  
type
```

```
aPrinter object
```

```
printer = printersByID[key]
```

```
if printer == nil {  
    printer = Printer()  
    printersByID[key] = printer  
}
```

◀ **Key**

◀ **Value**

◀ **Check if object exists in the cache**

◀ **Create if not in the pool**

◀ **Manage the cache**

# Summary

## **The Flyweight Pattern:**

- Reduces the memory usage
- Shares immutable state between objects
- Clients manage the mutable state

## **Pitfalls**

- Exposing the immutable state
- Failing to protect the shared state from concurrent access