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A ColdFusion, Flex & AIR Conference

Introduction to OO Modeling and Design

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CF

Fx

AIR

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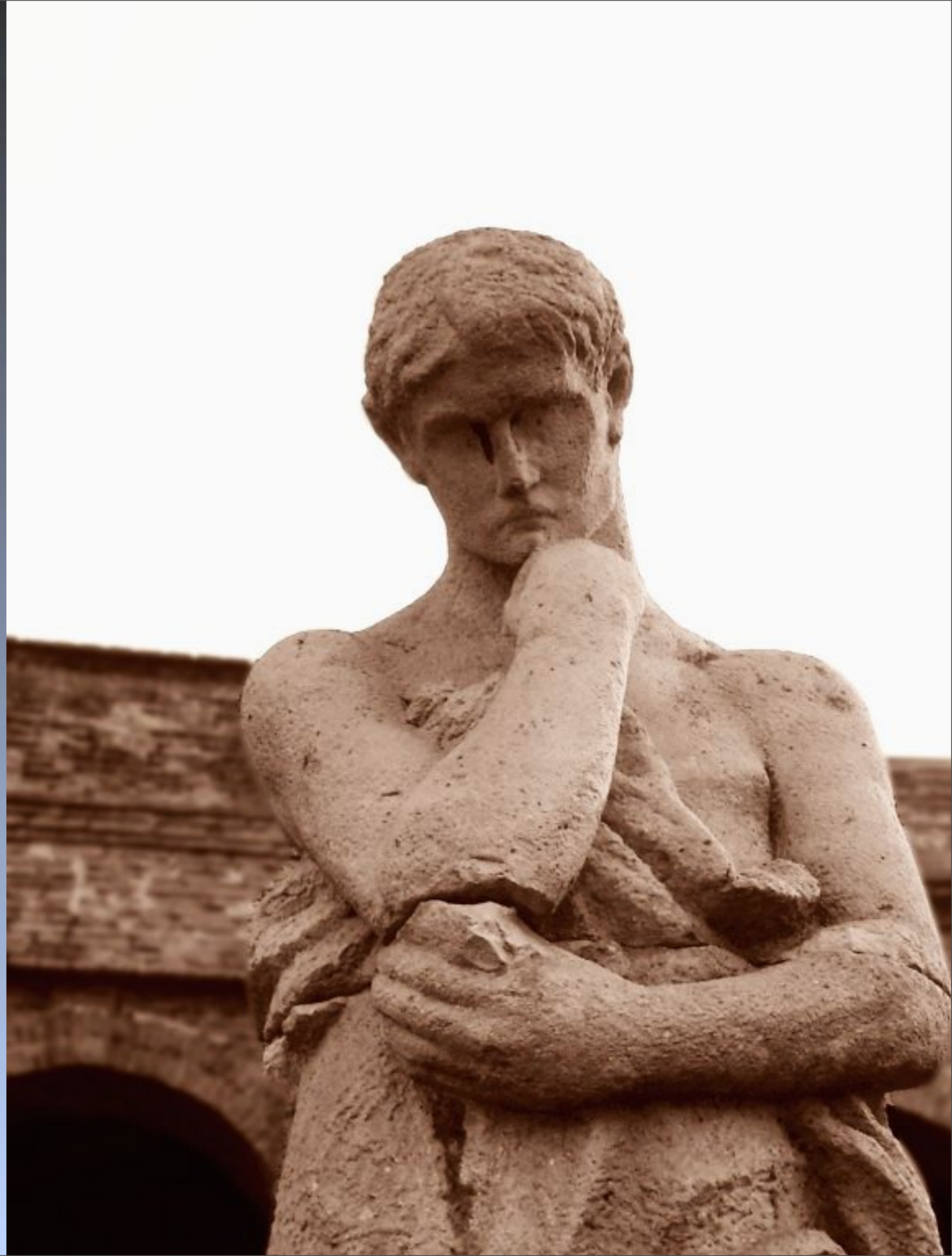
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Overview

- Thinking About Software Design
- Getting started
- UML Primer
- Design Principles
- Indicators of Design Quality
- Theory vs. Reality

We Won't Cover...

Thinking About Design



What Is “Good Design”?

What Is “Good Design”?

Elegant?

Simple?

Robust?

Flexible?

Appropriate?

Change
Happens



Design == Tradeoffs



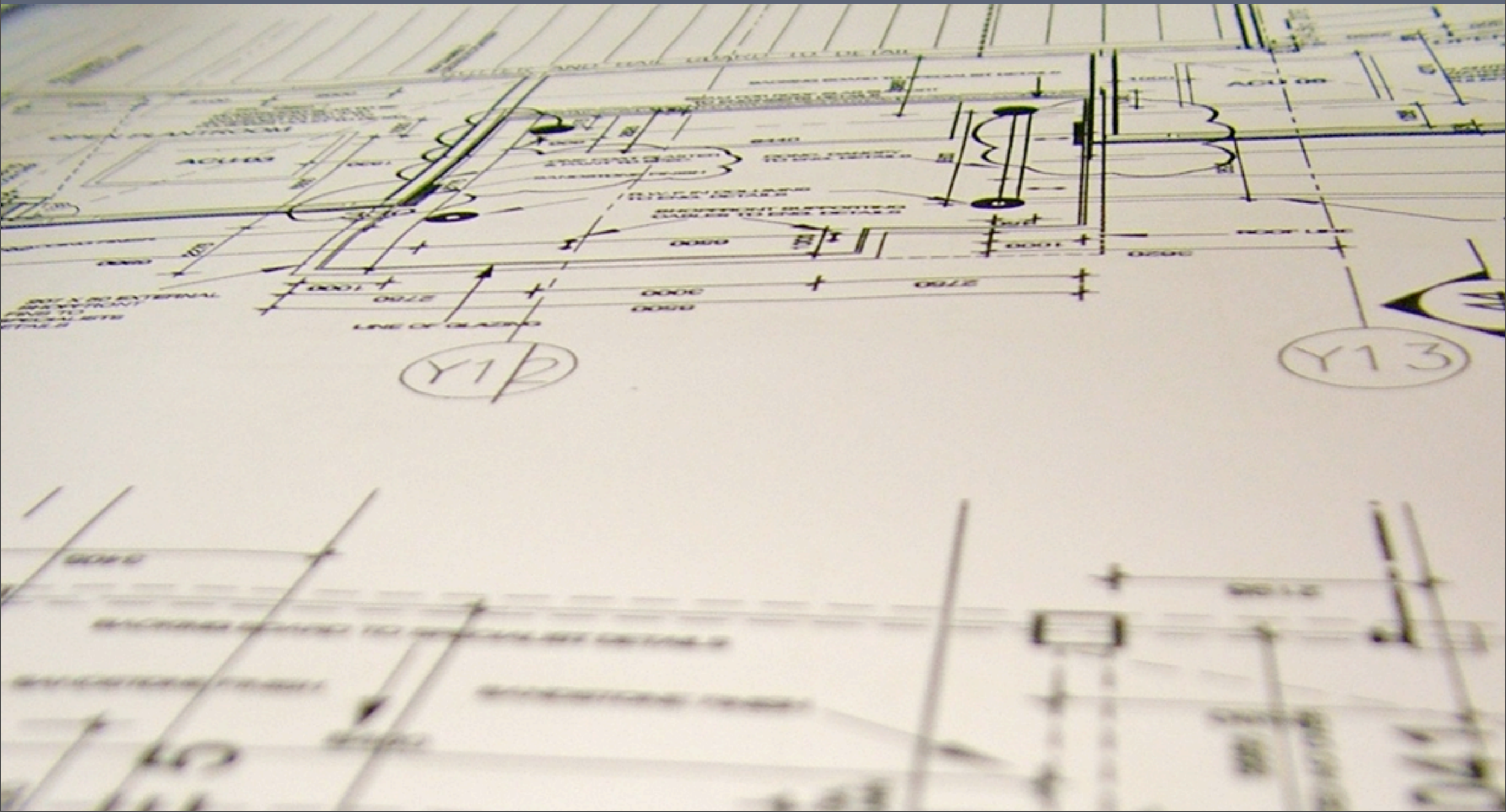


Both Art and Science

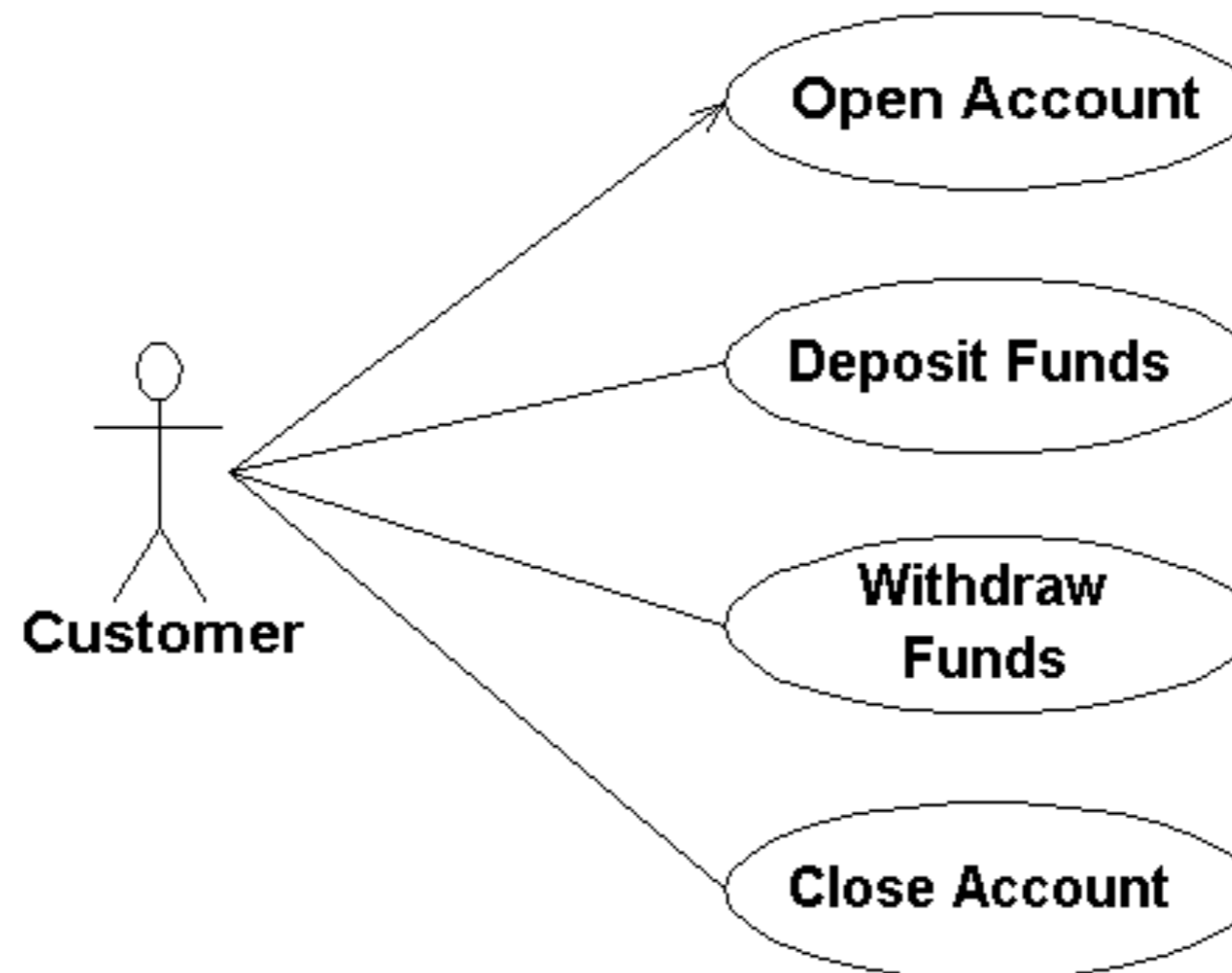


Both Art and Science

Where To Start?



Requirements and Use Cases



Identify **Nouns**
and **Verbs**

Nouns

- Customer
- Shopping Cart
- Product
- Invoice

Verbs

- Login
- Check Out
- Purchase
- Send Email

COMMONALITY

and

Variability

- Book
- MP3
- Credit Card
- PayPal
- PDF
- Paid Support
- Sales Tax
- Volume Discount

...

Buyable

- Book
- MP3

● Credit Card

● PayPal

● PDF

- Paid Support

● Sales Tax

● Volume Discount

...

Downloadable

- Book
- **MP3**
- Credit Card
- Pay-Pal
- **PDF**
- Paid Support
- Sales Tax
- Volume Discount

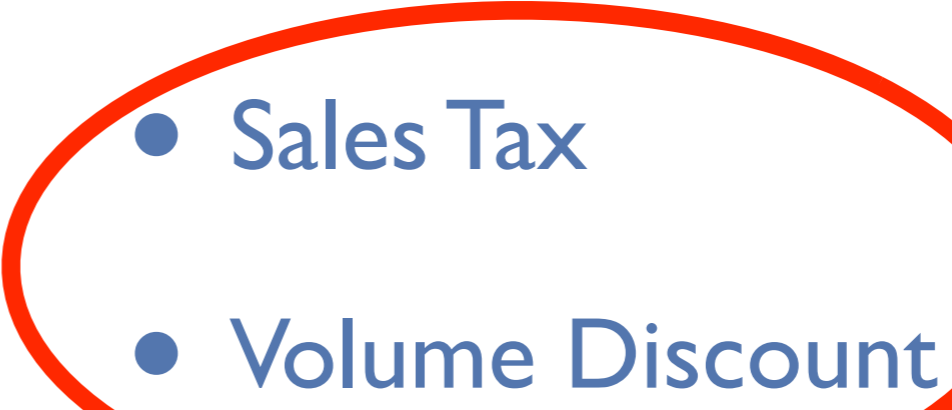
...

Ways to Pay

- Book
- MP3
- Credit Card
- PayPal
- PDF
- Paid Support
- Sales Tax
- Volume Discount

...

Affect Price

- Book
 - MP3
 - Credit Card
 - PayPal
 - PDF
 - Paid Support
 - Sales Tax
 - Volume Discount
- 

Basics of UML

Class Diagram

ClassName

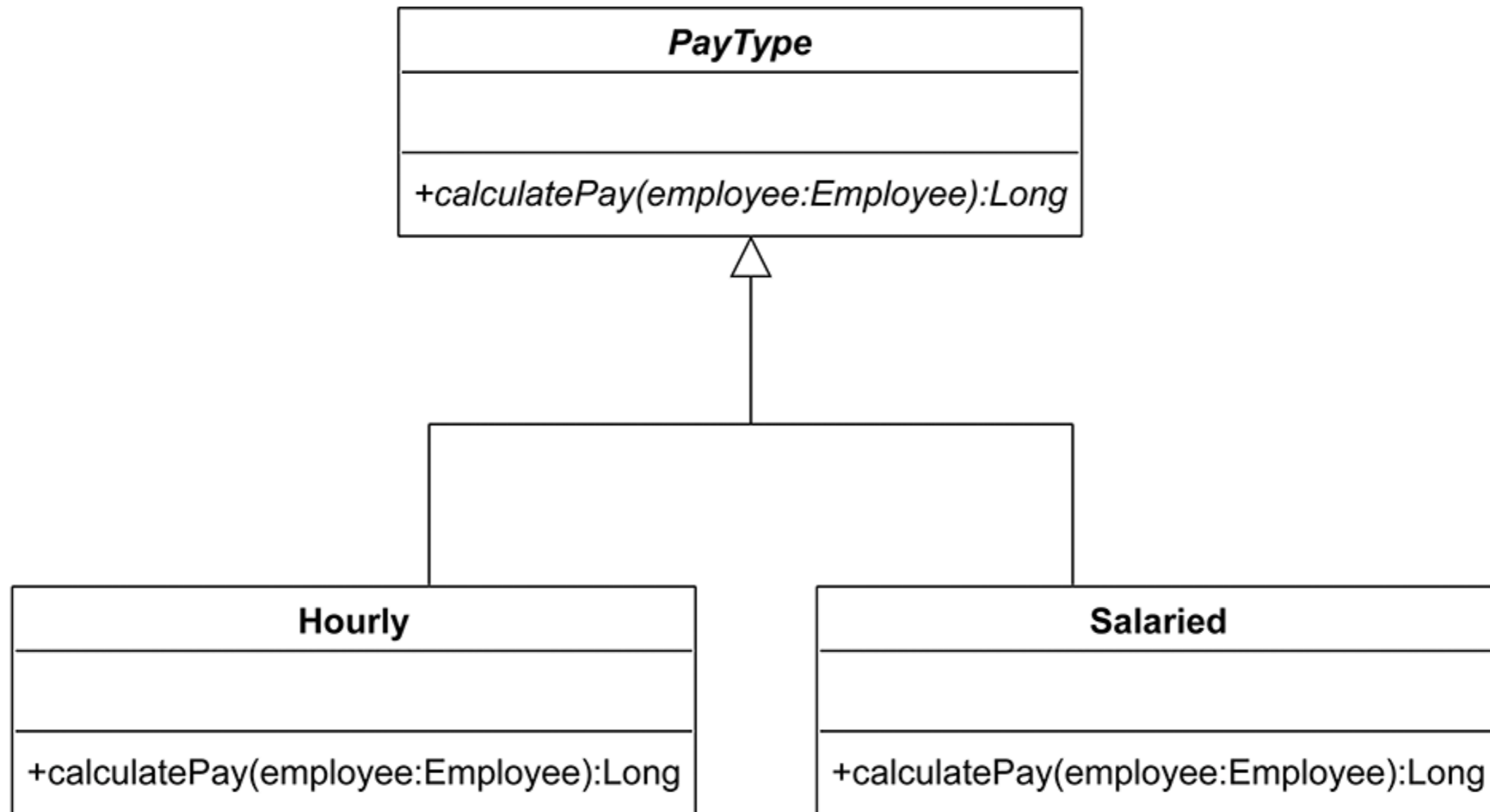
-privateProperty:Type

#protectedProperty:Type

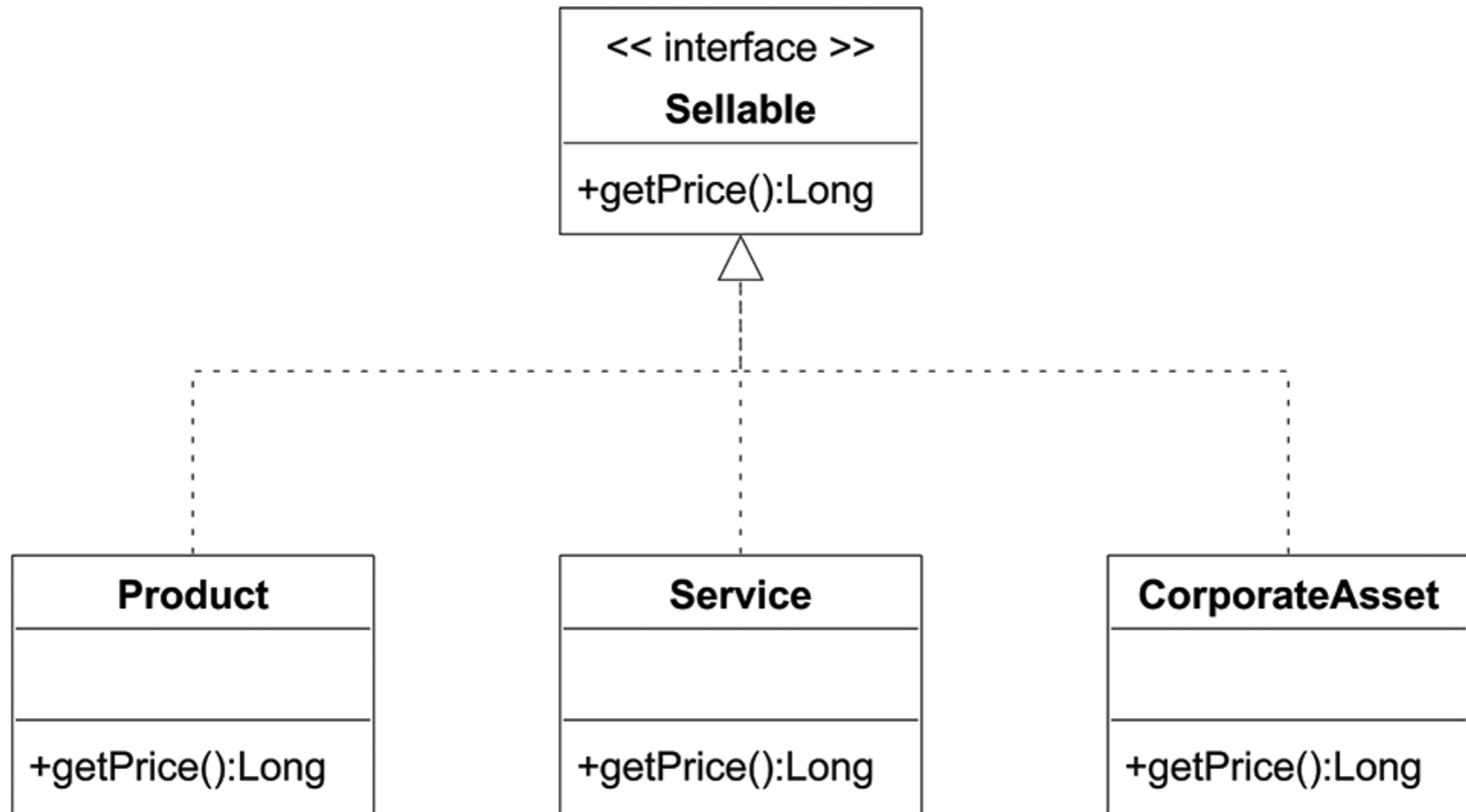
+publicProperty:Type

+method(parameter:Type):ReturnType

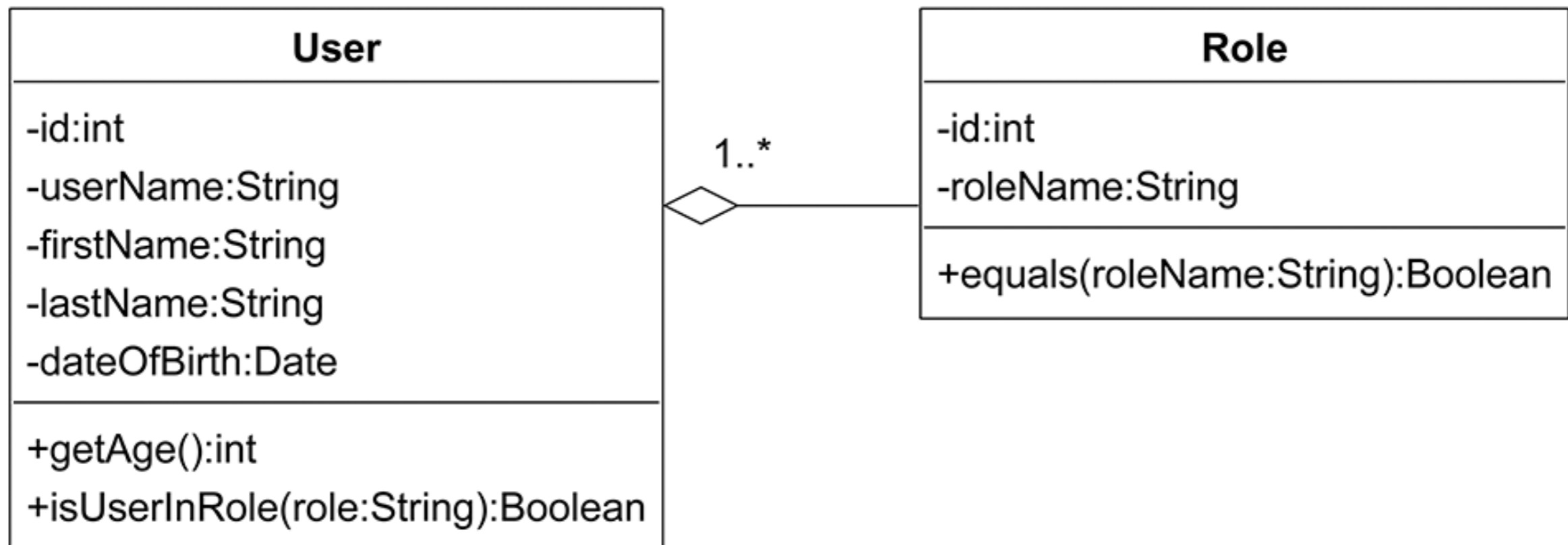
Inheritance



Interface



Associations



Design Principles

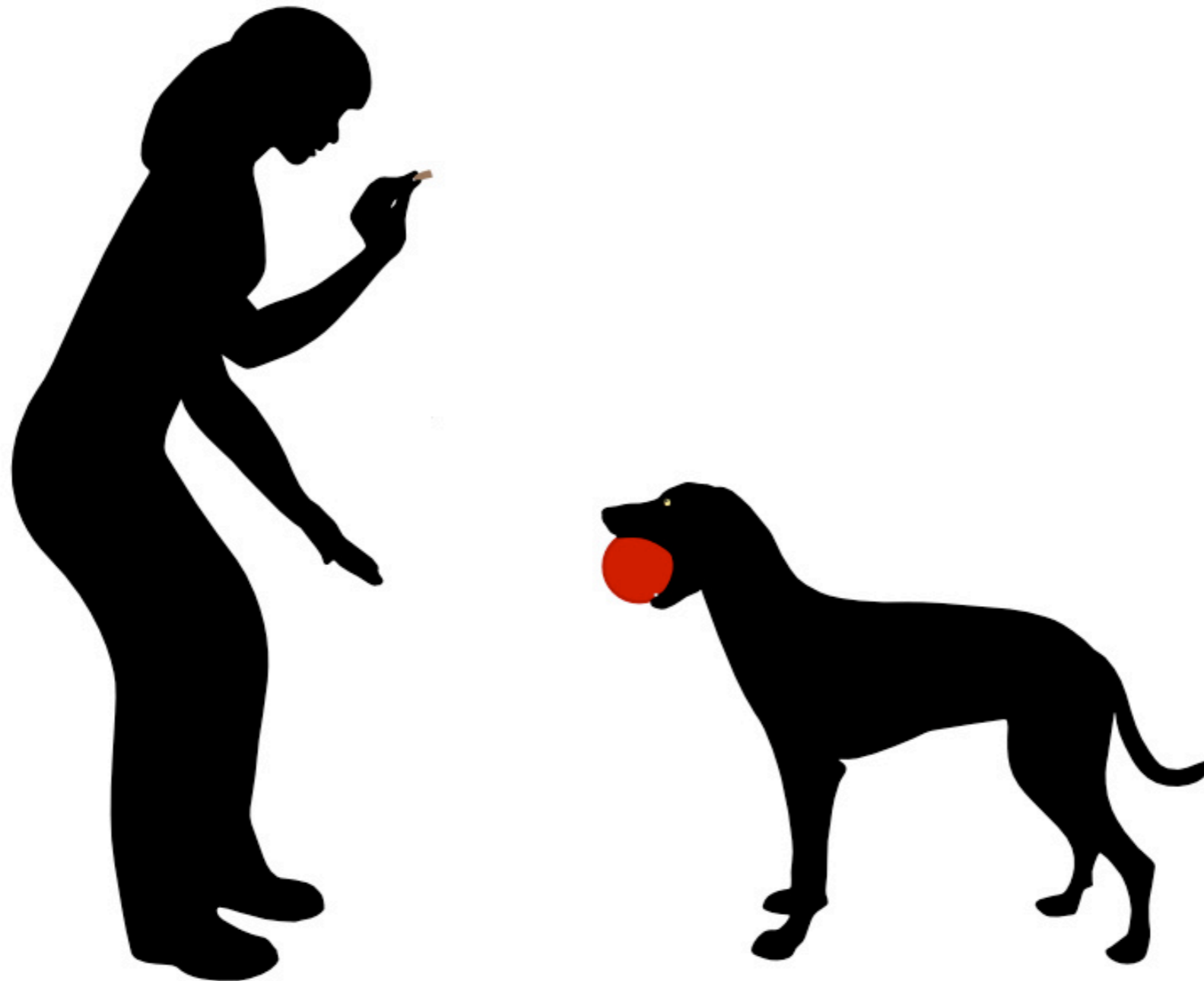
Single Responsibility Principle

DRY



OPEN / Closed
Principle

Tell, Don't Ask



Law of Demeter

...

Law of Demeter

```
employee.payType.calculatePay()
```

...

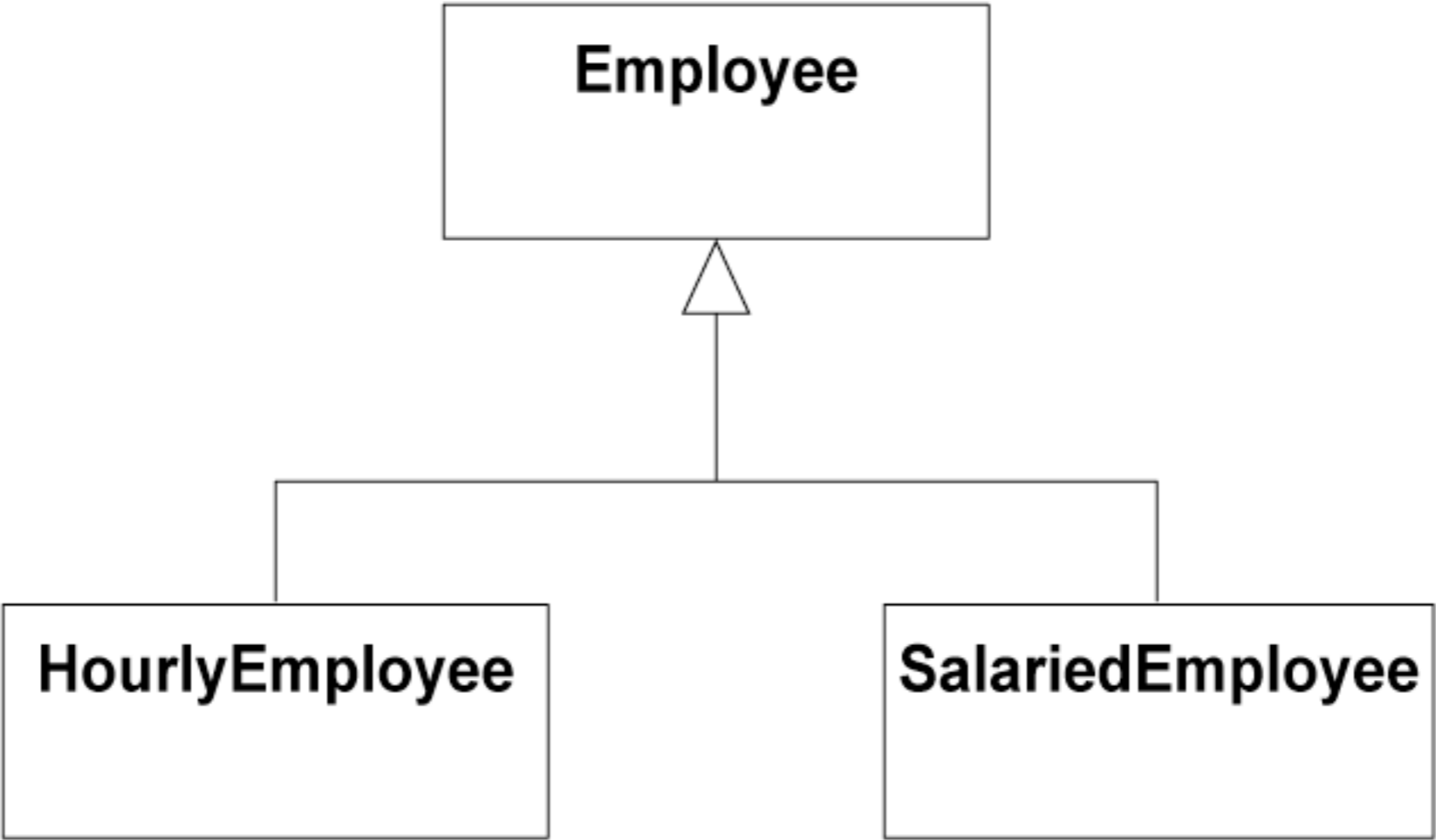
Law of Demeter

```
employee.pay()
```

Design to Interfaces



Favor Composition

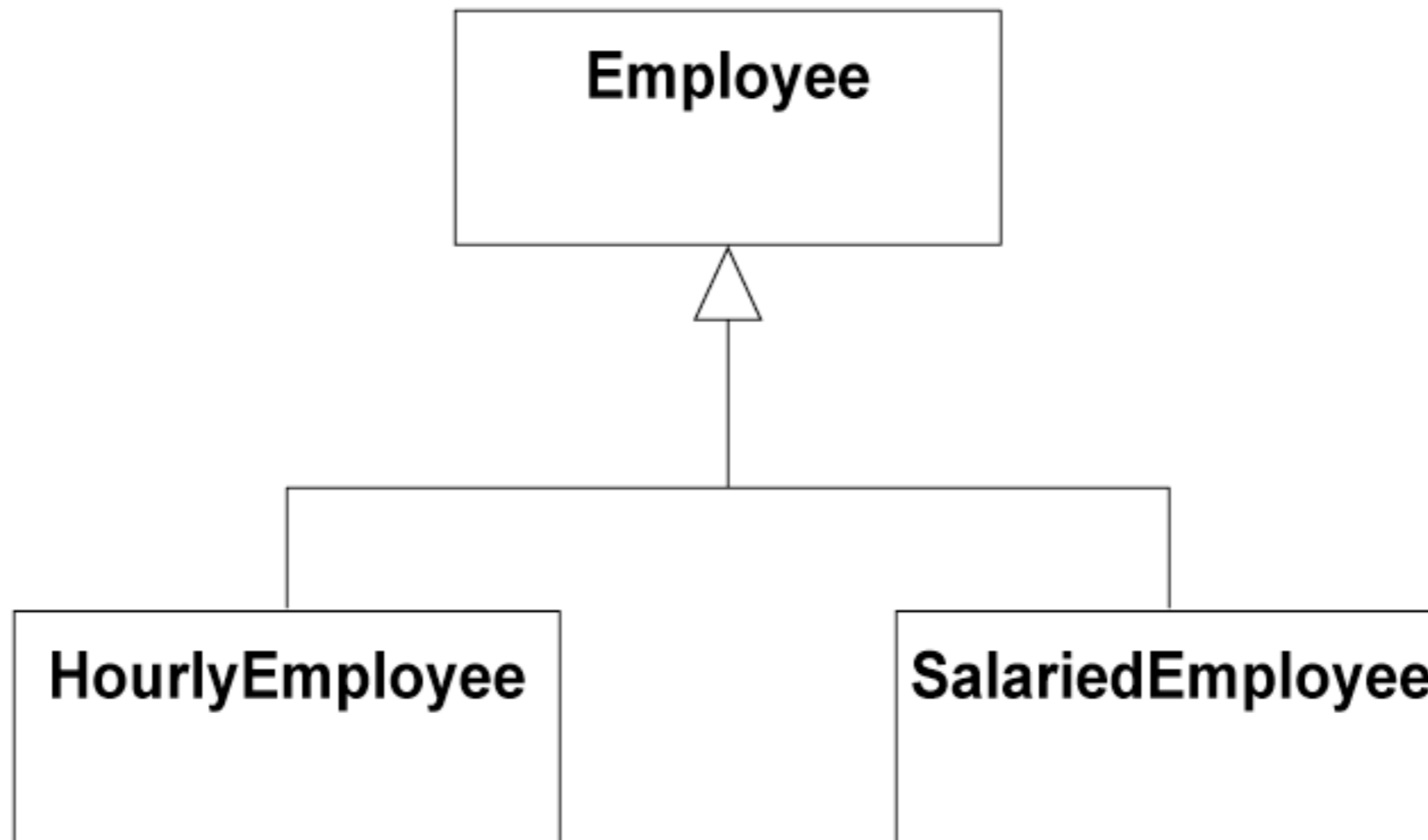


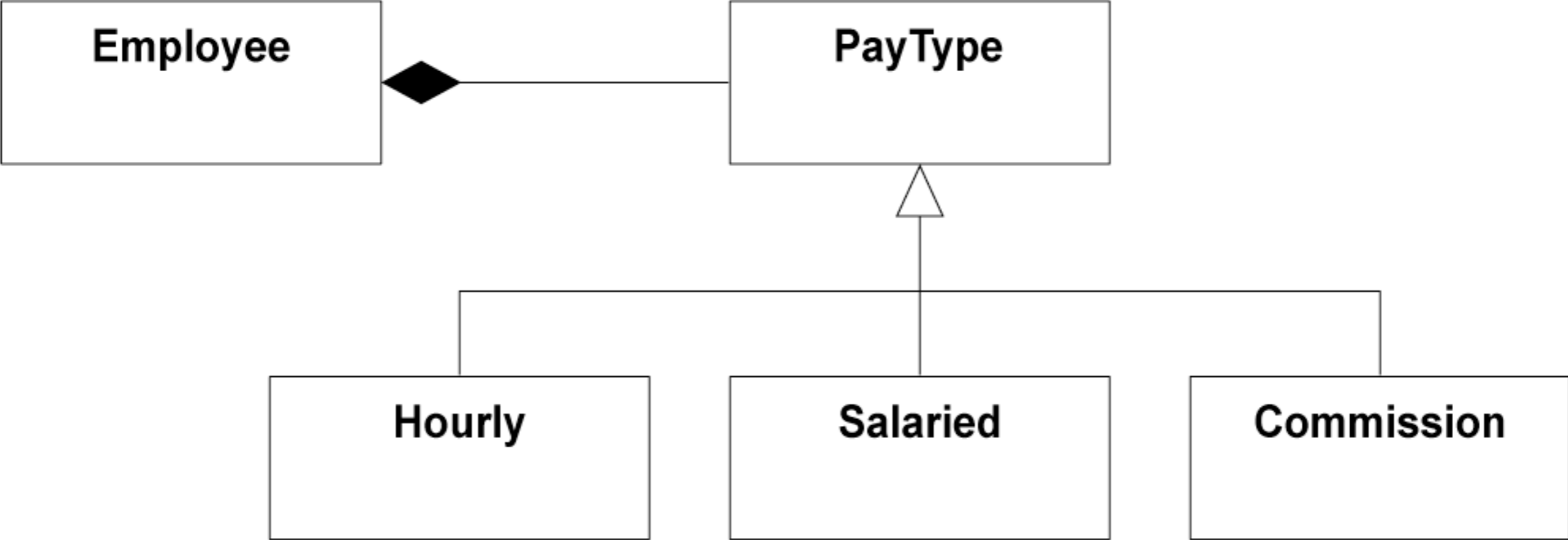
...

CommissionedEmployee?

SalaryTo40HoursThenOvertimeAfter45Employee?

PartTimeHourlyEmployee?





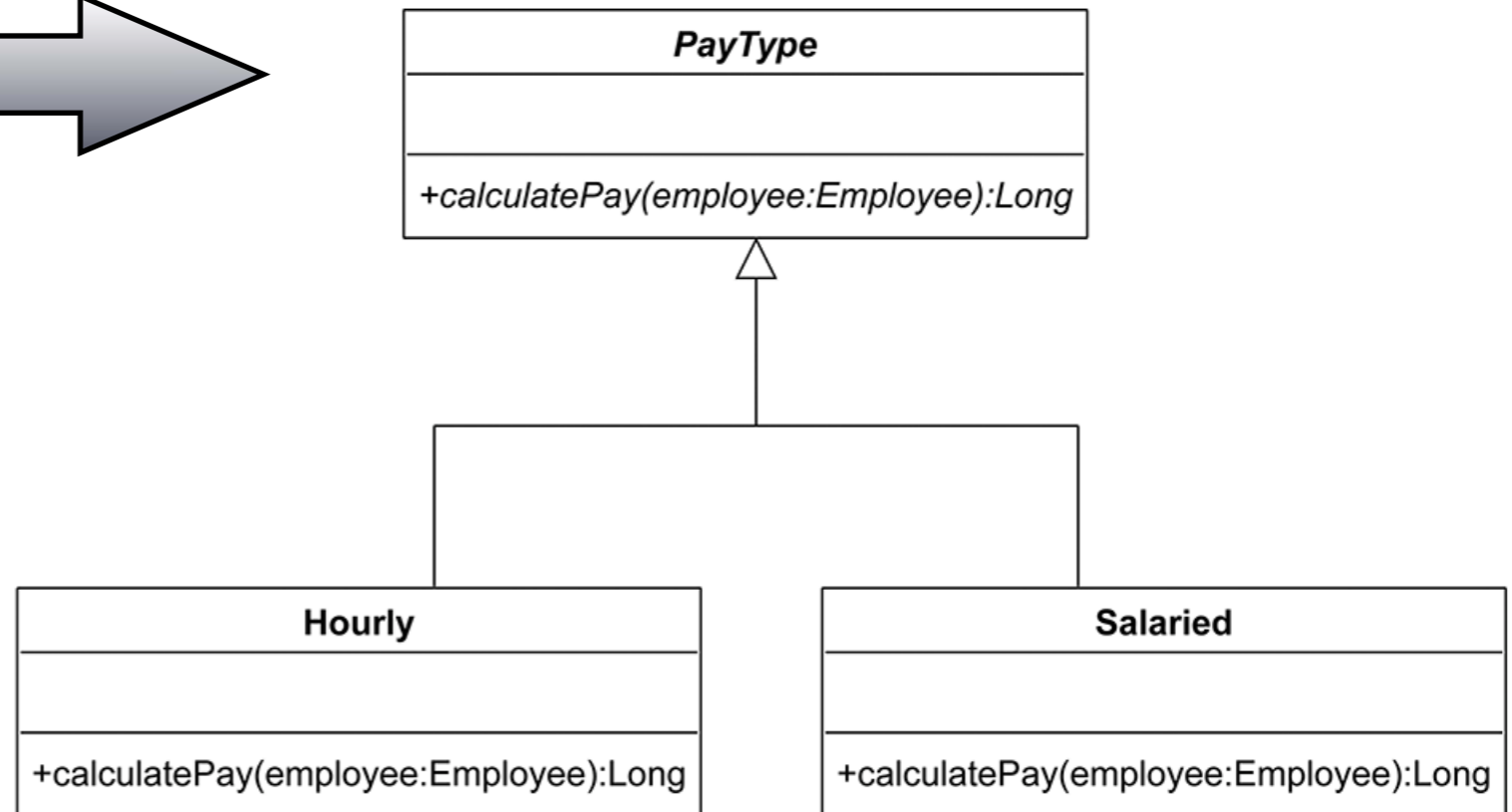
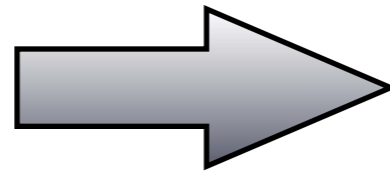
Encapsulation



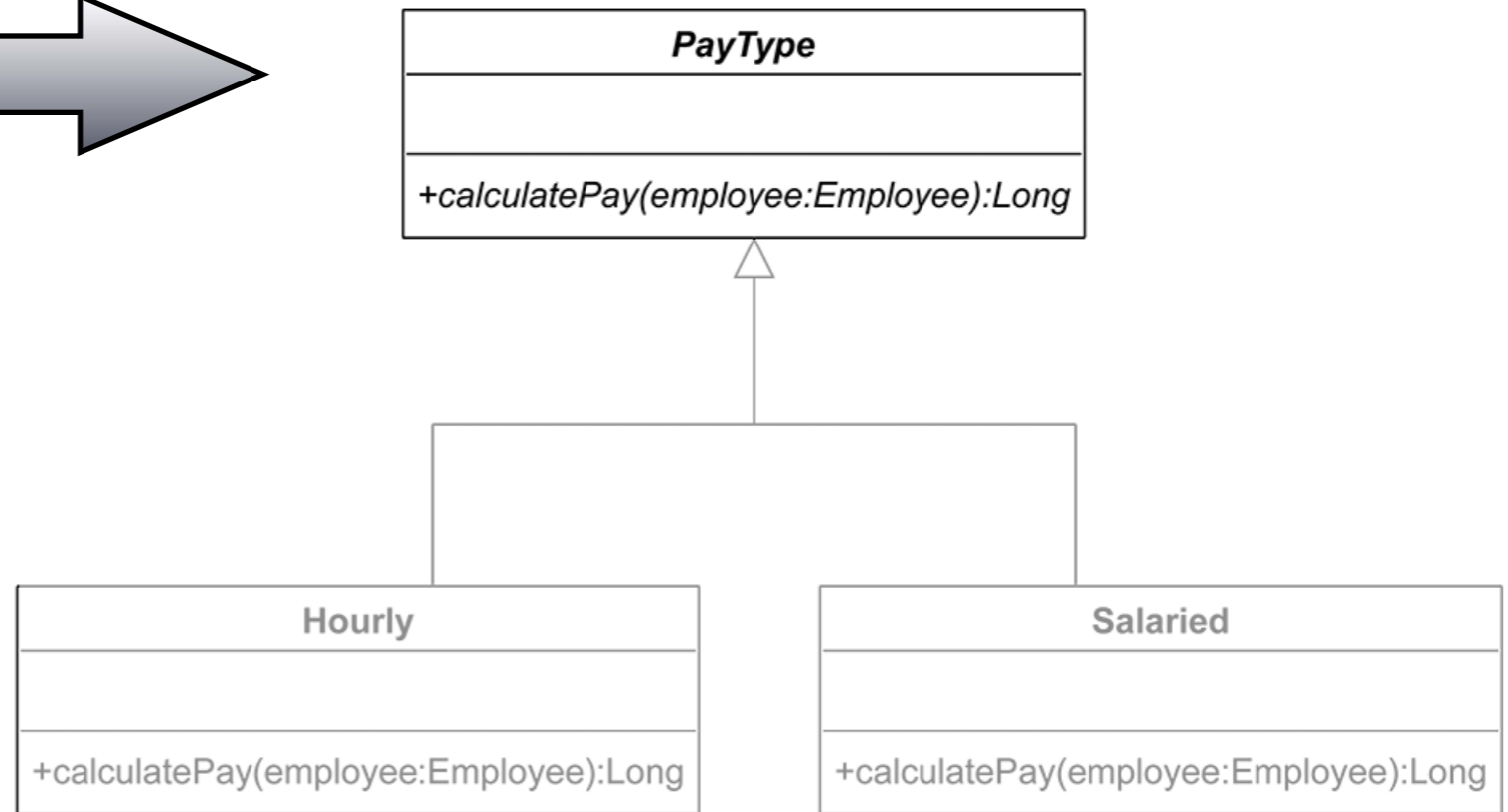
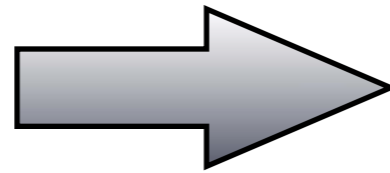
Data Encapsulation

Type Encapsulation

Calling Code

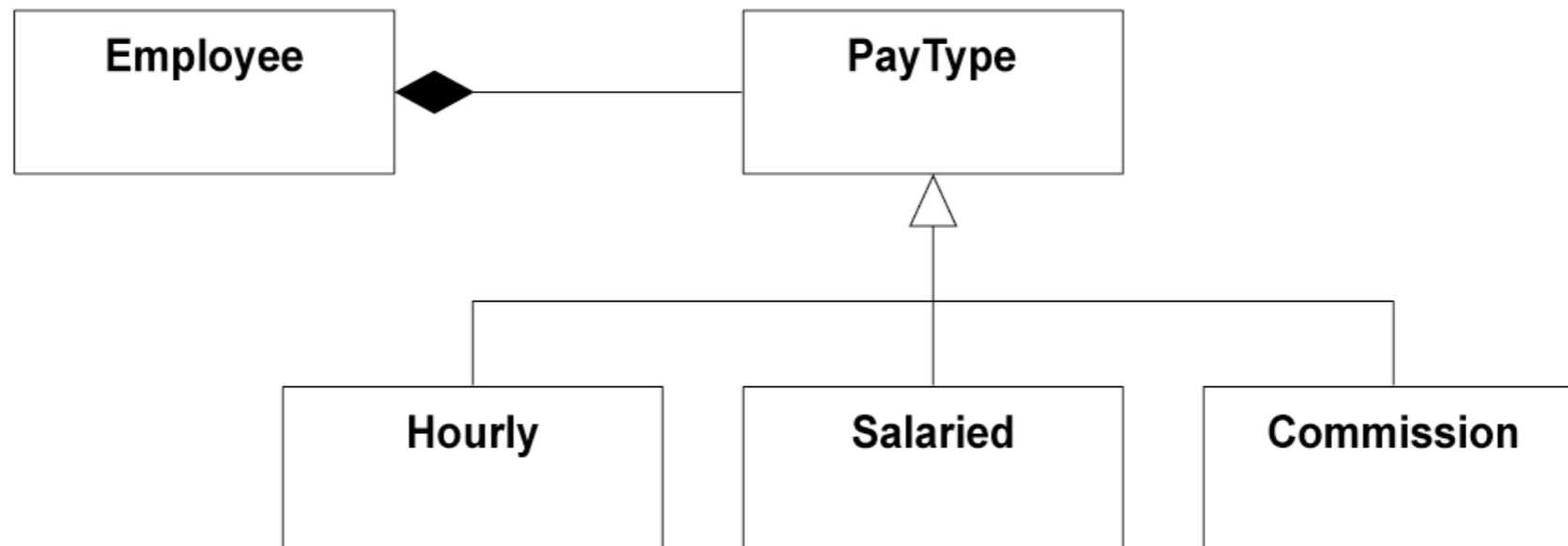
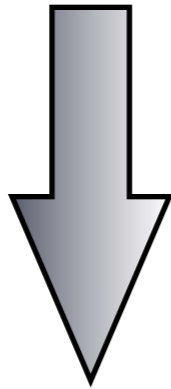


Calling Code

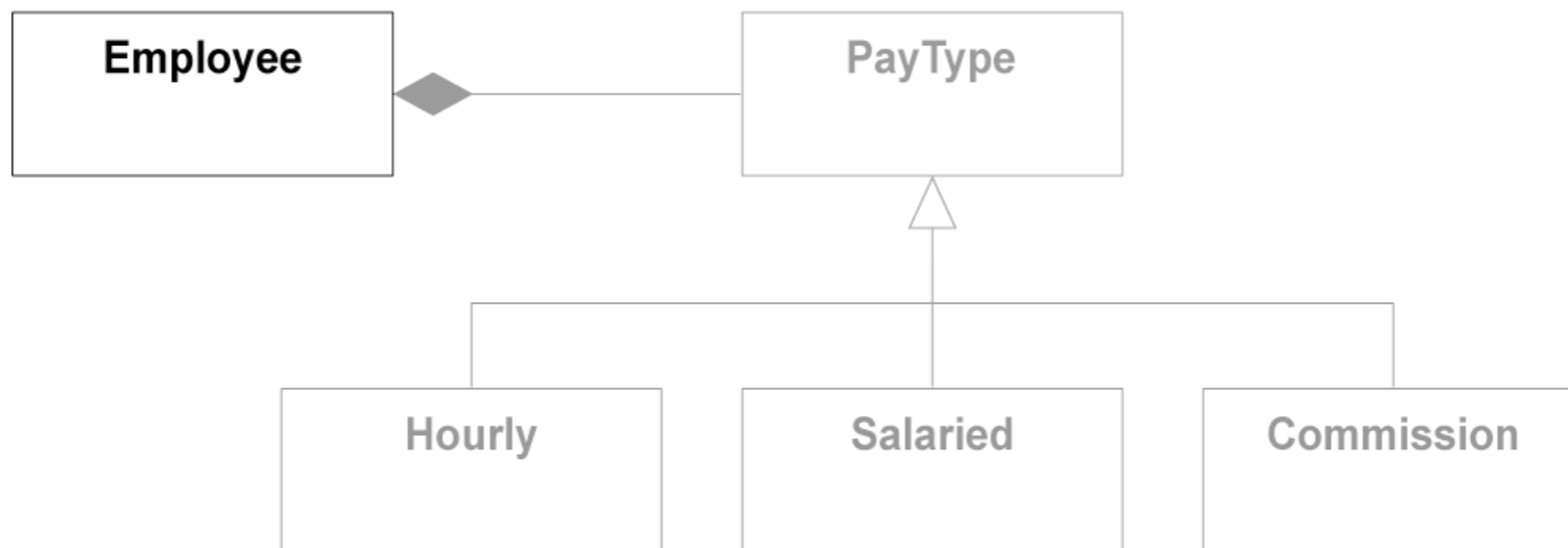
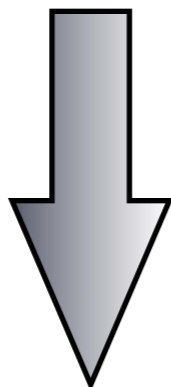


Implementation Encapsulation

Calling Code



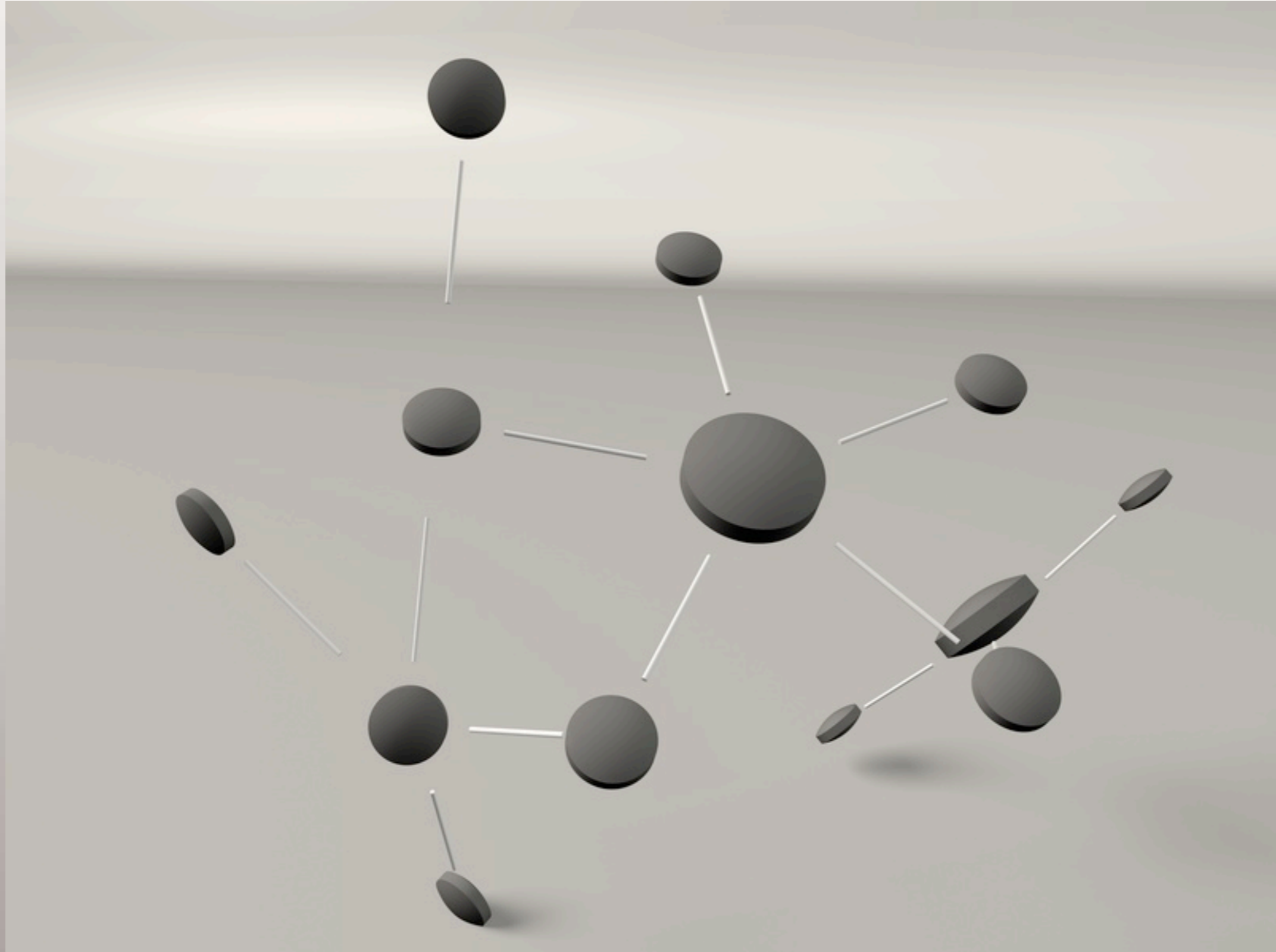
Calling Code



Encapsulate By
Convention,
Reveal By Need

Indicators of Design Quality

Loose Coupling / Connascence



Types of Coupling

Identity Coupling

```
public addUser( User user )
```

...

Identity Coupling

```
public addUser( User user )
```

Interface Coupling

```
user.addUser( user )
```

...

Interface Coupling

user.addUser(user)

Inheritance Coupling

```
price = super.price * discount
```

...

Inheritance Coupling

`price = super.price * discount`

Temporal Coupling

`processUpload(image)`

`crop(image)`

`createThumbnail(image)`

...

Temporal Coupling

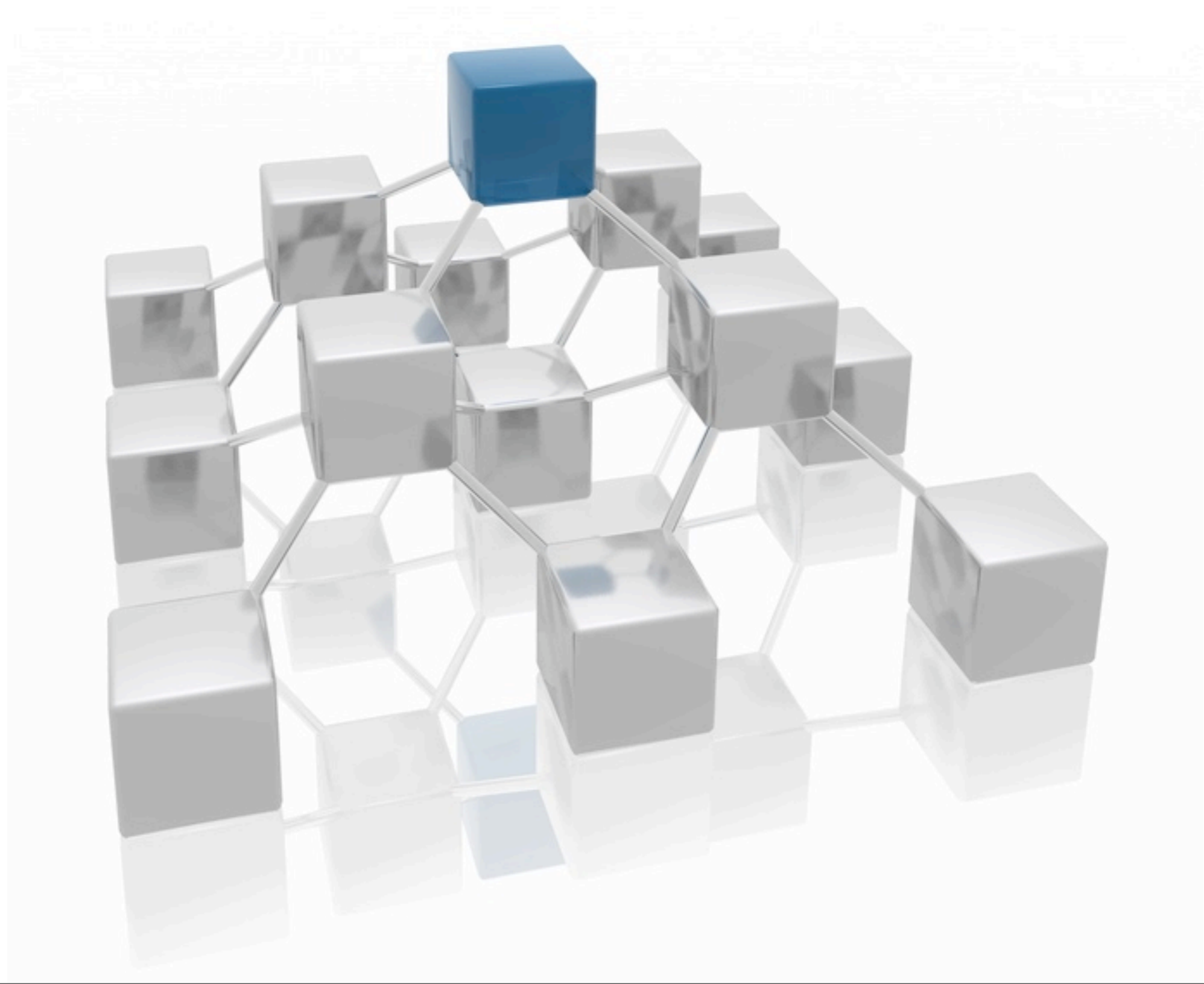
`processUpload(image)`

`crop(image)`

`createThumbnail(image)`

Cohesion

Class Reference Set



Testability



Theory Meets Real Life

“Data-Centric” Applications



Is There Such a Thing?

Not “All Or Nothing”

Is OO Worth It?

Where To Go
From Here

Object Calisthenics

<http://www.briankotek.com/blog>

Search for “Calisthenics”

Patterns and Antipatterns

Books

Conclusion

Questions?

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