Object Oriented Analysis & Design
面向对象分析与设计

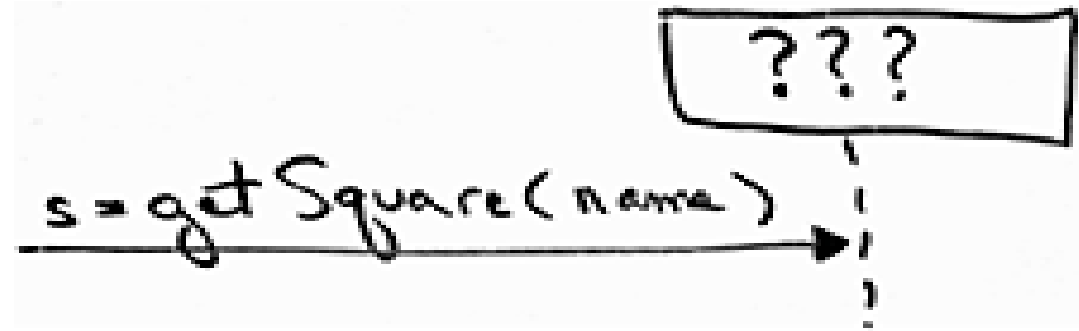## **Lecture_07 通用的职责分配软件原则 GRASP**

主讲: 姜宁康 博士

2、GRASP原则二：信息专家 Information Expert

- **What is a general principle of assigning responsibility to objects? 为一个对象分配职责的一般原则是什么?**
- **"鸡鸣狗盗"**
  战国时候，齐国的孟尝君喜欢招纳各种人做门客，号称宾客三千....

2.1 Mini Exercise 2

- **Given a key, which object can tell me about**
  - **...Square in Monopoly**

    $s = get Square(name)$

    ???

  - **...Total money of a sale in POS**

- **Note:**
  - **this is a knowing responsibility**

2.2 GRASP rule2: Information Expert

- **Name: Information Expert (信息专家)**
- **Problem:**
  - **What is a general principle of assigning responsibility to objects?**
- **Solution:**
  - **Assign responsibility to the class that has the information necessary to fulfill responsibility**

2.2 GRASP rule2: Information Expert

- **Information**
    - **an object's own state,**
    - **about other objects, the world around an object,**
    - **information the object can derive,**
    - **and so forth**
- **Answer to Mini exercise 2**
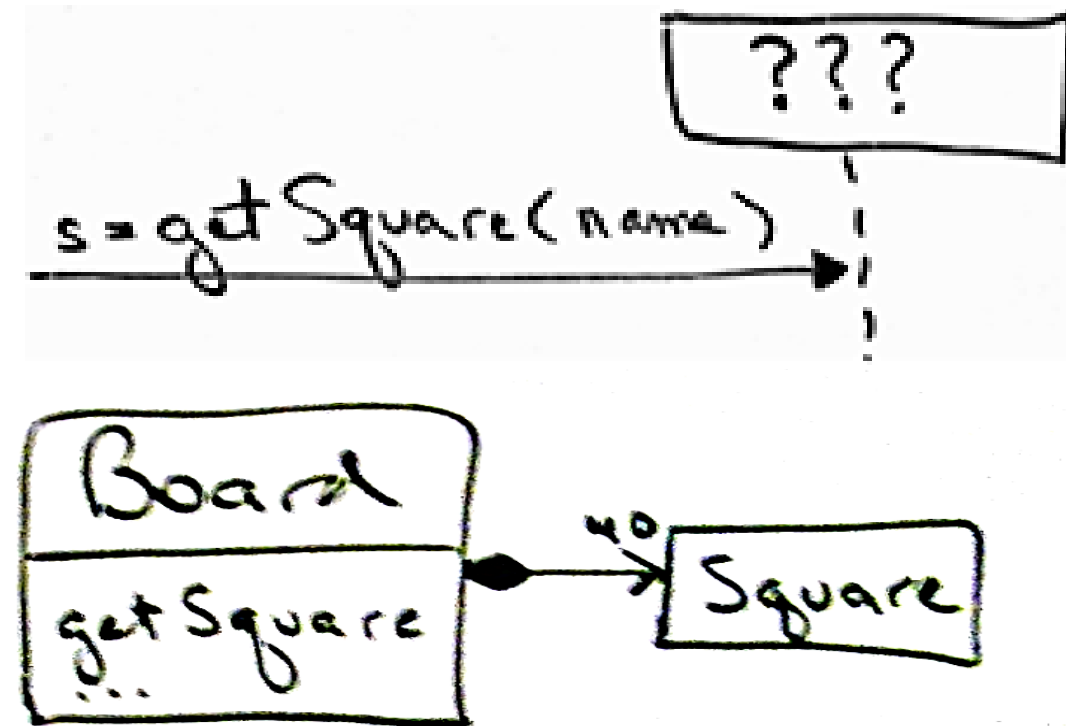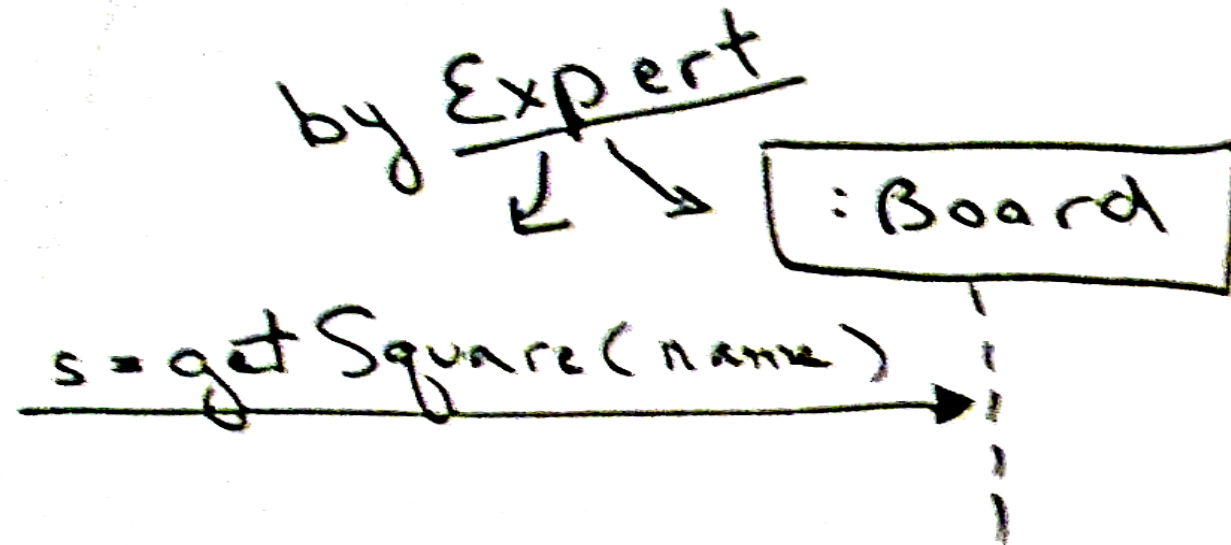
2.3 Information Expert — How to?

- **步骤**
  - **1) Clearly state the responsibility**
  - **2) Look in Design Model for relevant classes**
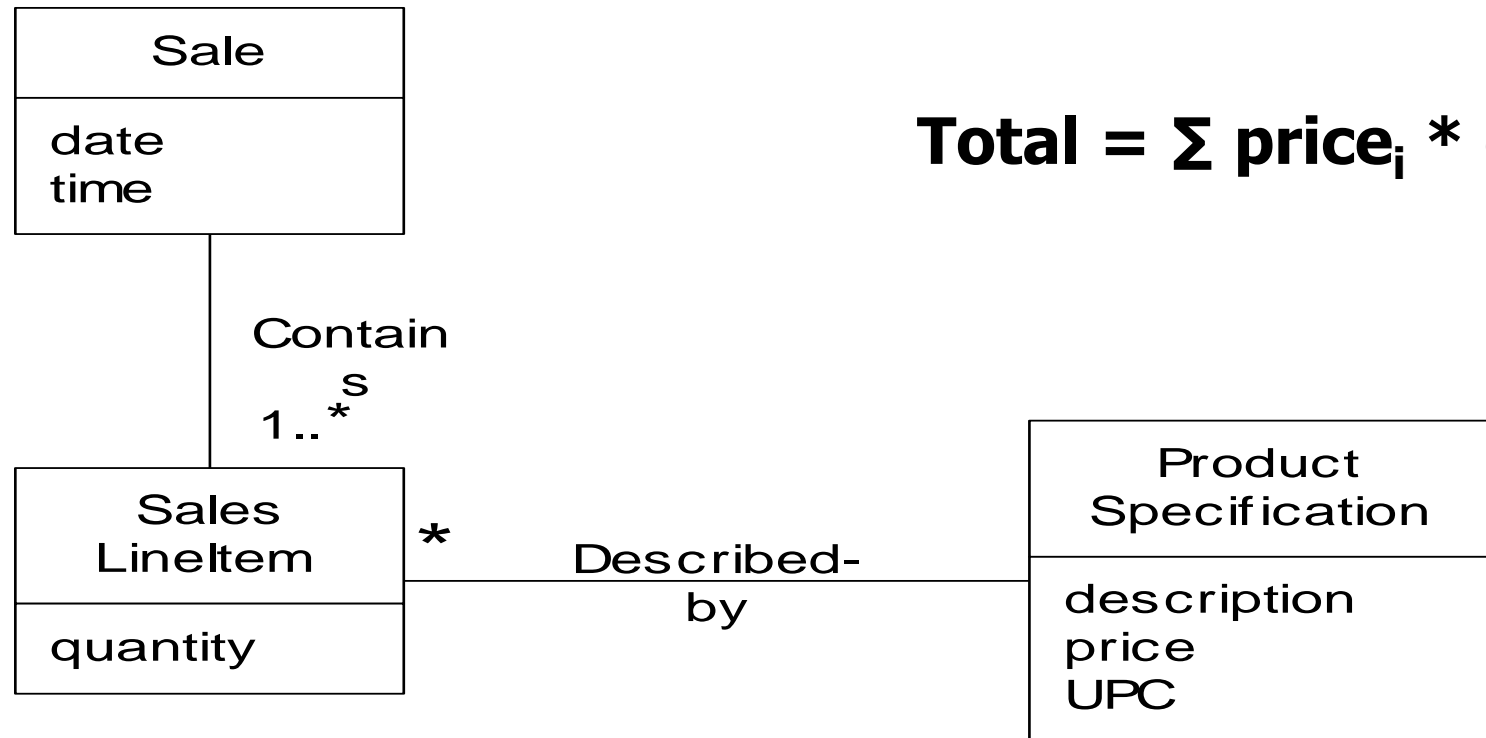 - **3) Else look in Domain Model and create design classes**

- **信息专家的优点**
  - **封装性 Encapsulation**
    - **对象充分利用自身的信息 objects support their own information**
    - **支持低耦合 supports low coupling**
  - **系统行为分布到不同的类 Behavior is distributed across classes**
    - **支持高内聚 supports high cohesion**

2.4 Example— Sale Total

- **Who should know the grand total (总计) of a sale?**

Total = Σ price$_i$ * qty$_i$

Tell me the total money?

Sale
date
time

Contains
1..*

Sales
LineItem
quantity

*

Described-by

Product
Specification
description
price
UPC

- **Product Specification has information about Price so it is expert for that (getPrice method)**
- **SalesLineItems has information about ProductSpec and Quantity so it is expert for SubTotal (getSubTotal method)**
- **Sale has information SalesLineItems with associated PriceTotal so it is expert for SaleTotal (getTotal method)**

2.4 Example— Sale Total

t = getTotal →

: Sale

1 *: st = getSubtotal →

lineItems[i] :
SalesLineItem

Sale

time
…

getTotal()

A New method

Calculating the Sale total

1.1: p := getPrice()

:Product
Description

SalesLineItem

quantity

getSubtotal()

A New method

**Product
Description**

description
price
itemID

getPrice()

New method

2.4 Example — Sale Total

Hence responsibilities assign to the 3 classes

Class	Responsibility
Sale	knows sale total
SalesLineItem	knows line item subtotal
ProductSpecification	knows product price

2.5 Example—How to control game loop?

- **Monopoly is played as a series of rounds in which each player takes a turn**
  - **What object should control the game loop to manage the rounds?**
- **By the Expert Pattern, the playRound object can be managed by the MonopolyGame**

- **本讲结束**