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

Lecture_04 面向对象分析(二)

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2、CRC方法标识概念类...

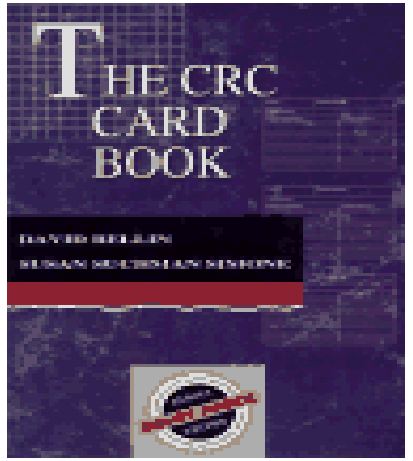
- Identifying Classes and Objects
- 一种发现概念类并分配职责的途径 One way to find class and assign its responsibilities ("Responsibility-Driven Design")
- 从"领域类、用例"到"设计类" From Domain Classes and Use Cases to Design Classes

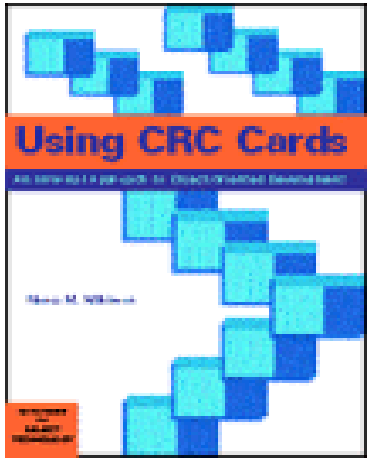
2.1 CRC

- **Stands for:**
  - **Classes (of objects) 类**
  - **Responsibilities (of the objects in each class) 职责**
  - **Collaborations (with objects in other classes) 协作**
    - **In UML, these will be examples of "associations"**

2.1 CRC

- **Contributors:**
  - **Kent Beck and Ward Cunningham** ['kʌnɪ̄əm], **formerly of Tektronix in Oregon**
    - **also founders of the ideas of XP and design patterns**
  - **Rebecca Wirfs-Brock popularized with "Responsibility-Driven Design" (RDD)**
  - **References**
    - **David Bellin and Susan Simone, The CRC Card Book, Addison Wesley Longman, 1997**





2.1 CRC

- 又称为CRC索引卡片：CRC card
- 每张卡片代表一个类 Each card represents one class
- 每张卡片上写出这个类承担的职责、与其合作交互的其他类名CRC cards are paper index cards on which one writes the responsibilities and collaborators of classes
- CRC建模讨论会
  - a group sitting around a table, discussing and writing on the cards as they play "what if" scenarios with the objects
  - considering what they must do and what other objects they must collaborate with
- 例如，废品回收机

类名	与这个类协作的其他类
类的职责	

Customer panel	Dep. item receiver
▪ receive items ▪ receive print request	

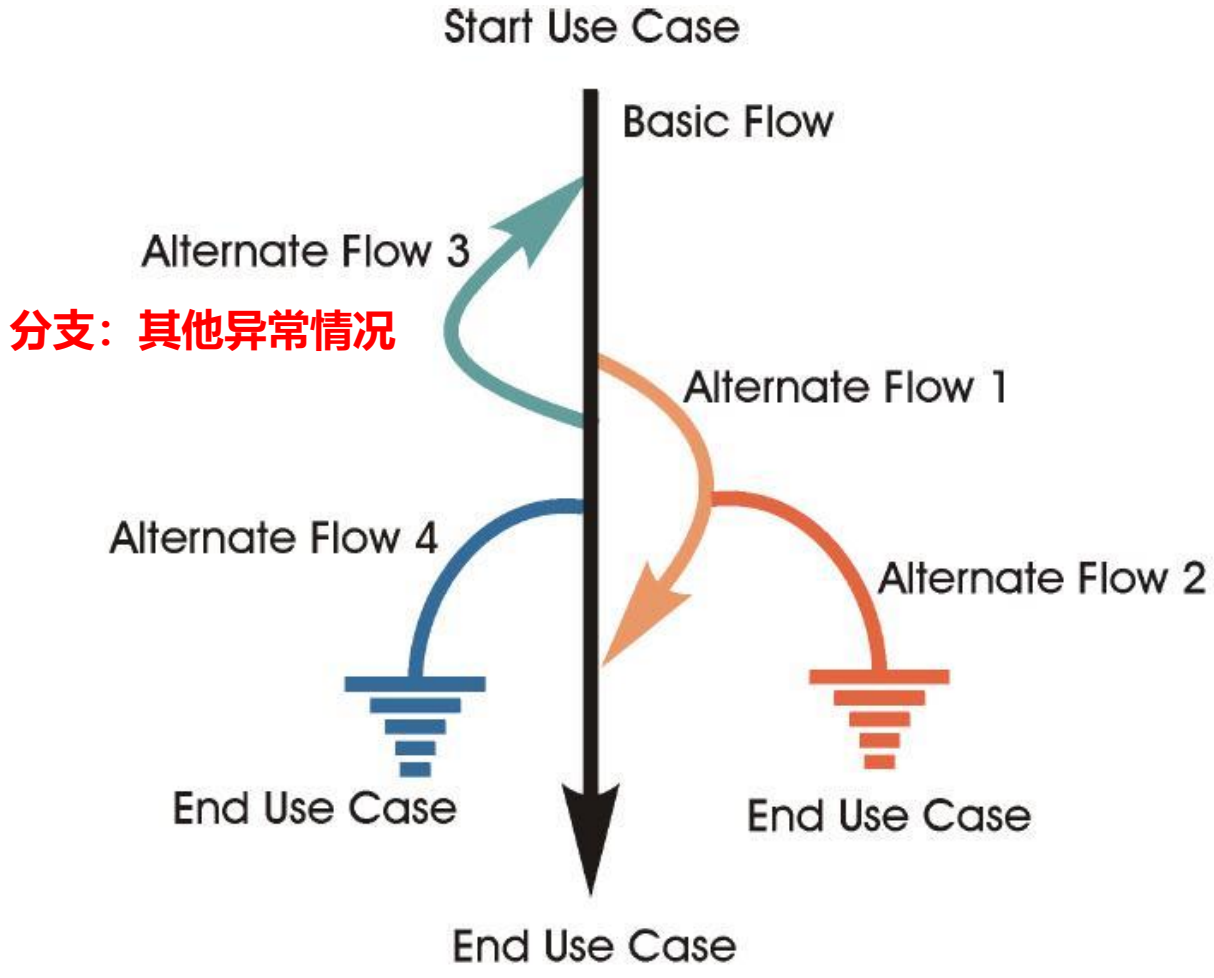
Dep. item receiver	
▪ classify items ▪ create Receipt Basis ▪ print receipt	▪ Printer ▪ Deposit Item ▪ Receipt Basis

2.1 CRC

- CRC 的特点
  - 非正式的、不是很细节的 Informal, non-detailed
  - 采用小组“头脑风暴”的形式提出概念 Used for group brain-storming
  - CRC的目标不是提供完整的设计 Not intended to provide a complete design
  - CRC产生的结果需要进一步精化 End result is a first cut at classes for an object-oriented model

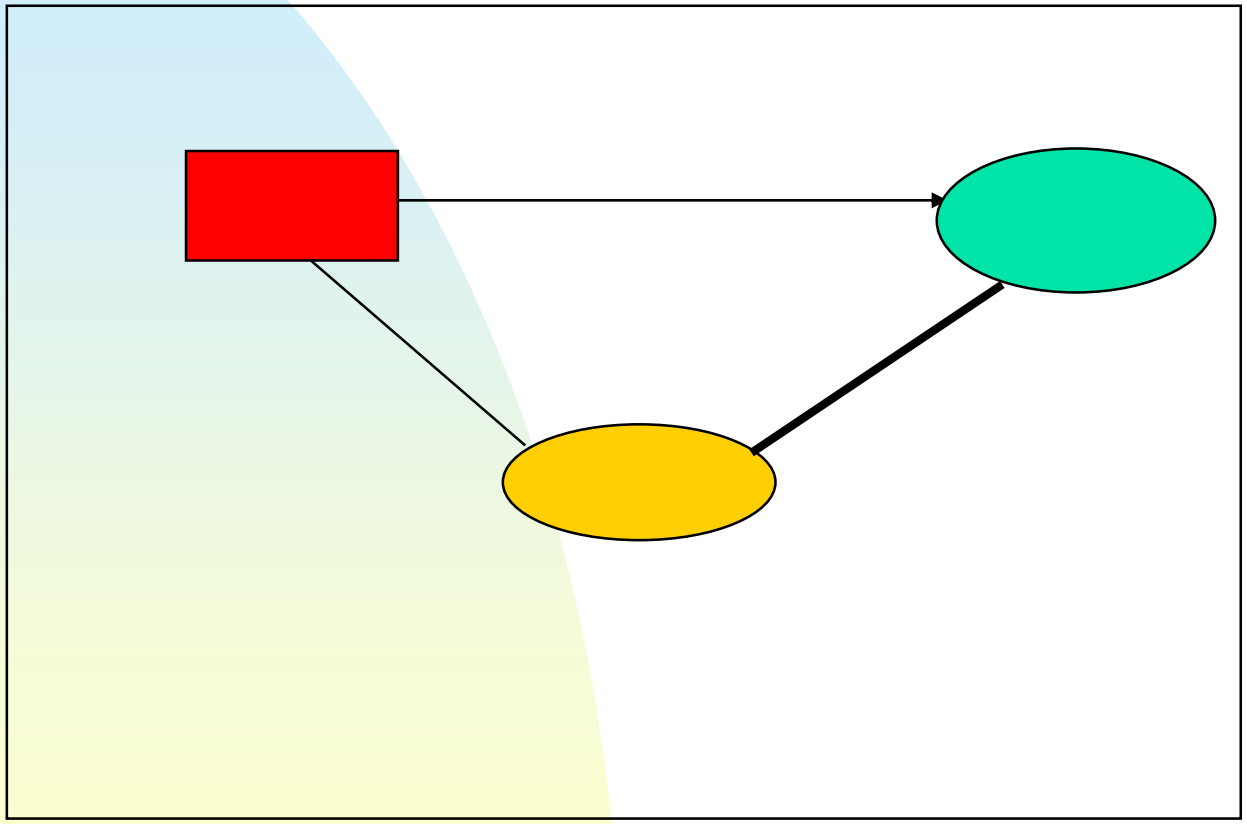
2.2 CRC 的输入信息: 用例模型

- 用例模型
  - 用例图、边界、用例描述，清楚地描述了系统需求，作为CRC概念类分析的起点 A good starting point for CRC analysis is a clear statement of all of the use-cases
  - Use-cases drive the introduction of CRC cards
- 用例描述的正常事件流、异常事件流，可以作为CRC的“角色扮演”的脚本 Use-cases, or their accompanying scenarios, can be used as a kind of script for the role-playing method (角色扮演)of checking the CRC cards
  - “角色扮演”也可以用顺序图来代替 The role-playing could be replaced with sequence diagrams



2.3 CRC简单案例：绘图工具软件

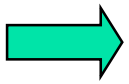
Process screen image



Typical Use-Cases of Application

- Draw shape
- Move shape
- Resize shape
- Connect shapes
- Erase shape
- Erase connector

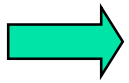
2.3 CRC简单案例：绘图工具软件

Class 

Shape

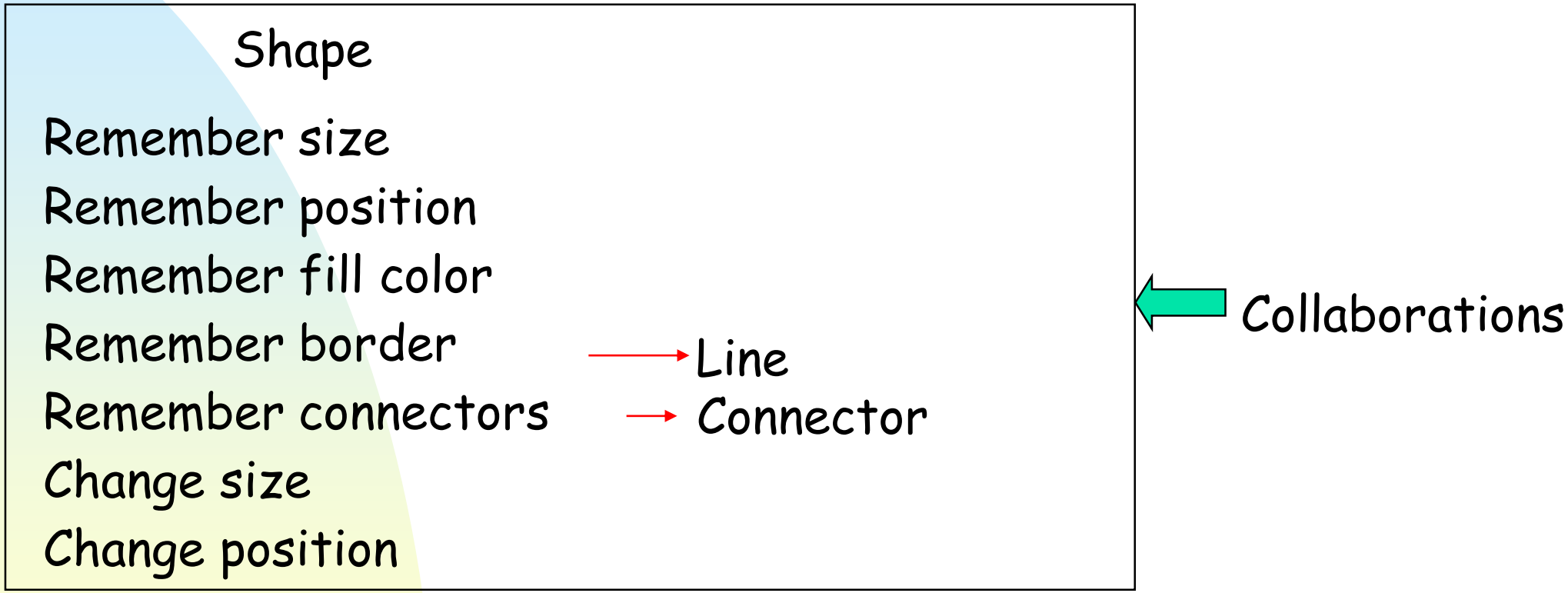
2.3 CRC简单案例：绘图工具软件

Responsibilities



Shape
Remember size Remember position Remember fill color Remember border Remember connectors Change size Change position

2.3 CRC简单案例：绘图工具软件



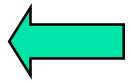
2.3 CRC简单案例：绘图工具软件

Shape	super class: Drawable
Remember size Remember position Remember fill color Remember border Remember connectors Change size Change position	sub-classes: Rect, Oval, Group Line Connector

2.3 CRC简单案例：绘图工具软件

Responsibilities

Drawable	super class:
Draw self on canvas	sub-classes: Shape Canvas



Collaborations

注意：“Drawable”不必要记住“Canvas”，可以把Canvas作为参数传进来。

2.3 CRC简单案例：绘图工具软件

Responsibilities

Canvas	super class:
Remember Drawables contained in self.	sub-classes: Drawable

Collaborations

初步的概念类：Shape、 Drawable、Canvas、Line、Connectors、Rect、Oval

- 本讲结束