



# Object Oriented Analysis & Design

## 面向对象分析与设计

### Lecture\_06 从分析到设计

**主讲: 姜宁康 博士**



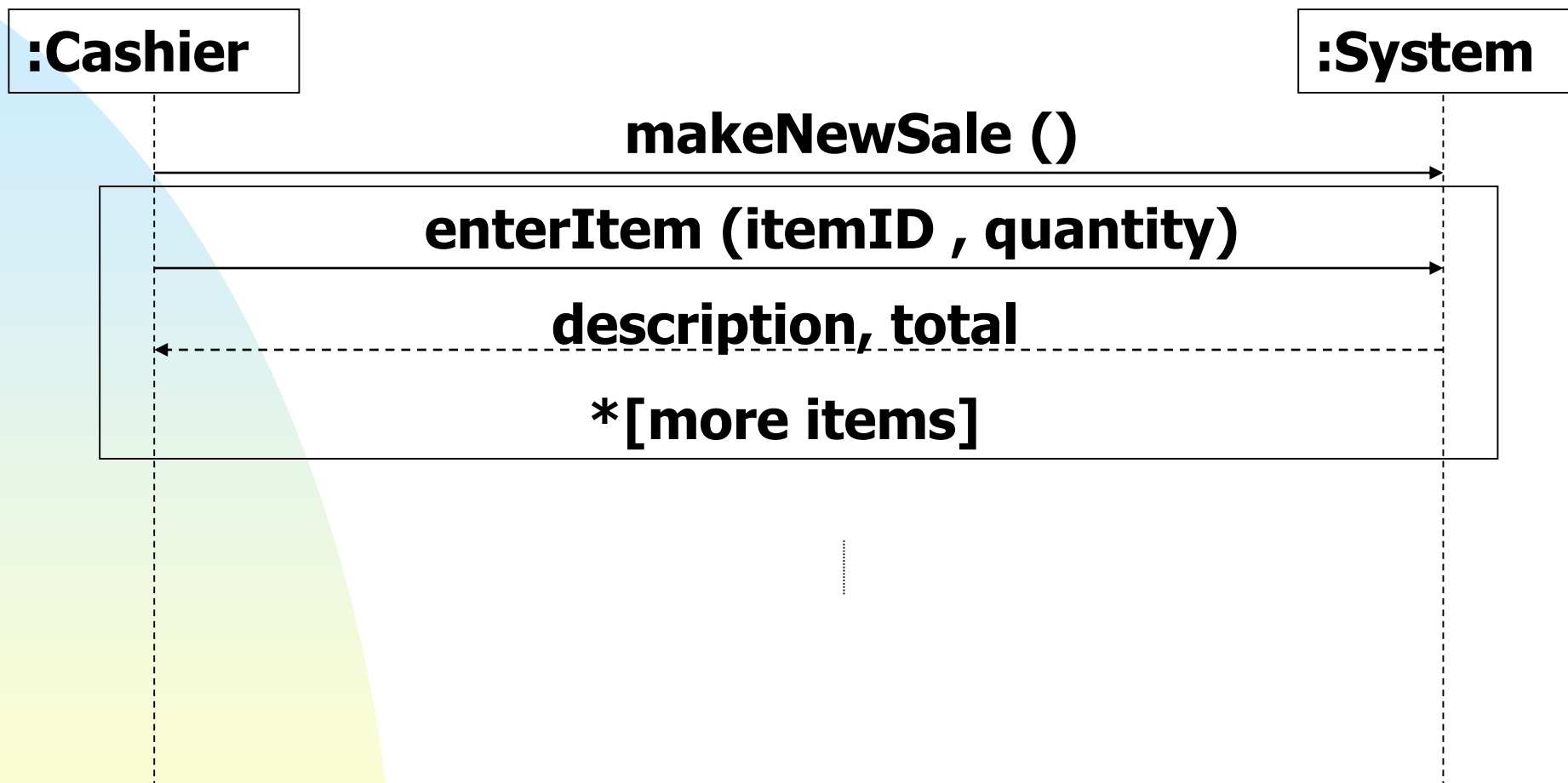
## ■ 4、操作契约 Operation Contracts

- “用例描述” 的补充
- 强调：用例中**重要**的动作，其开始与结束是需要一些约束

## 4.1 操作契约: 用例模型的补充

- **什么是操作契约? Operation Contracts**
  - a way to describe use cases in more detail
  - part of the Use Case Model
- **复习**
  - 用例 Use cases – 描述需求的一种方法、手段
  - 对于特定的场景, 系统顺序图? system sequence diagrams
  - 什么是系统操作?
  - 用例模型与领域模型, 是平行开发的: 相互启发、互为参照

## 4.2 系统操作 System Operations



整个系统操作都定义在“系统接口 **system interface**”处

## 4.3 操作契约示例

### enterItem () 操作的契约:

**Operation:** enterItem(itemID: ItemID, quantity: Integer)

**Cross References:** Use Cases: ProcessSale

**Preconditions:** There is a sale underway

**Postconditions:**

- A SaleLineItem instance sli was created

- sli was associated with the current Sale

- sli.quantity became quantity

- sli was associated with a ProductDescription, based on itemID match

## 4.4 操作契约的格式

### ■ 格式

Operation:	Name of operation, and parameters 操作名称与参数
Cross References:	Use cases this operation can occur within 操作所属的用例
Preconditions:	important assumptions about the state of the system or objects in the Domain Model before execution of the operation. These are non-trivial assumptions the reader should be told 前置条件
Postconditions:	<b>This is the most important section.</b> The state of objects in the Domain Model after completion of the operation <b>这是最重要的环节!</b> 当操作完成后, 领域模型里面的对象应该保证的状态

## 4.5 操作契约的后置条件

### ■ 定义 Definition

- 后置条件描述了领域对象状态的变化 describe changes in the state of objects in the domain model
- 状态变化包括
  - 是否创建、删除了对象？ instances created / deleted
  - 对象间的关系是否发生变化？ associations formed or broken
  - 有对象的属性变化了吗？ and attributes changed

### ■ 为什么要后置条件？ Why post-condition

- 也不是始终都需要的 they aren't always necessary
  - 如果开发人员很容易明白该如何去做，就不用写操作契约了 If developers can comfortably understand what to do without them, then avoid writing contracts
- 操作契约比较细节地、精确地定义了一个操作应该承担的职责
- 契约，是面向对象分析过程中非常有用的工具
  - 把问题说清楚、无歧义
  - 先不考虑设计，集中于分析 what must happen 而不是 how it is to be accomplished

## 4.6 创建后置条件

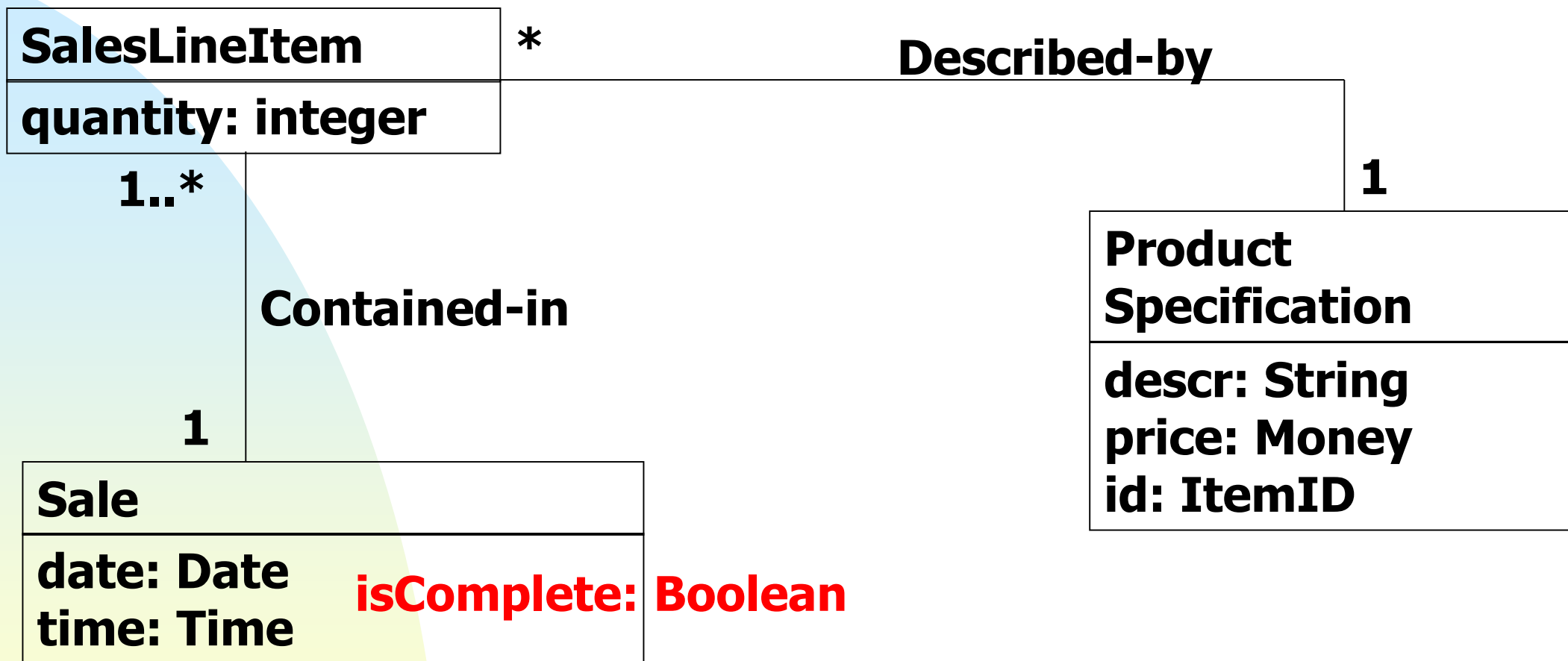
- **建议 Apply the following advice to create contracts**
  - Identify system operations from the SSDs
  - For system operations that are complex and perhaps subtle in their results, or which are not clear in the use case, build a contract
  - To describe the postconditions, use the following categories:
    - instance creation and deletion
    - attribute modification
    - associations formed and broken
- **常见错误**
  - 描述契约
    - (better) A SalesLineItem was created
    - (worse) A SalesLineItem is created; or Create a SalesLineItem
  - 忘记对象之间的关系发生了变化
    - The SalesLineItem was associated with the Sale (association formed)



## 4.7 后置条件 & 领域模型

- **后置条件体现在领域模型的对象** postconditions are expressed in the context of the Domain Model objects
  - What instances can be created?
    - those from the Domain Model
  - What associations can be formed?
    - those in the Domain Model
  - and so on
- **在定义契约的过程中，经常触发对领域模型的修改**
  - 记录新的概念类、属性？
  - 领域模型是否有新的关系？

## 4.8 对领域模型的修改



一笔 sale 结束了没有，谁负责记住这个信息？





■ **本讲结束**