Domain Models

Overview

- What is a domain model?
- UML class diagram
- How to build the domain model?

What Is a Domain Model?

- A visual representation of conceptual classes or real-situation objects showing:
  - Domain objects or conceptual classes
  - Relationship between conceptual classes
  - Attributes of conceptual classes
- Illustrated with a set of UML Class diagrams

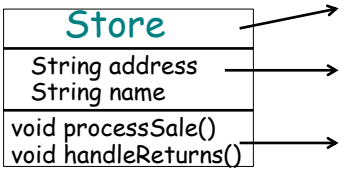
Roles of a Domain Model

- Built upon use cases
- Basis for design and implementation
- The most important and classic model in OO analysis

UML Class Diagram

- Definition
  - A visual representation of main objects and their relations for a system
- Elements
  - Classes containing: Attributes, Operations
  - Various relationship: Association, Aggregation, Composition, Generalization

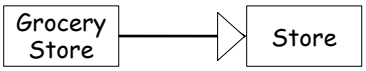
Legends



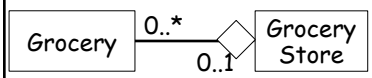
Class name: abstract concepts

Attributes: properties relevant to the problem

Operation (Method signatures): behaviors of the class

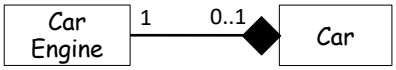


Generalization: "is-a" relationship. A sub-class inherits all attributes and operations of its super class



Aggregation: "has-a" relationship. The container and elements can exist independently from each other

Legends



Composition: stronger "has-a" relationship. If the container is destroyed, the elements it contains are usually destroyed as well.

Association: can generally represent any relationship other than "is-a". Both ***Aggregation*** and ***Composition*** are variants of ***Association***.

Multiplicity: what number of instances can be associated?

Name and Direction Arrow: to enhance understanding of the relationship

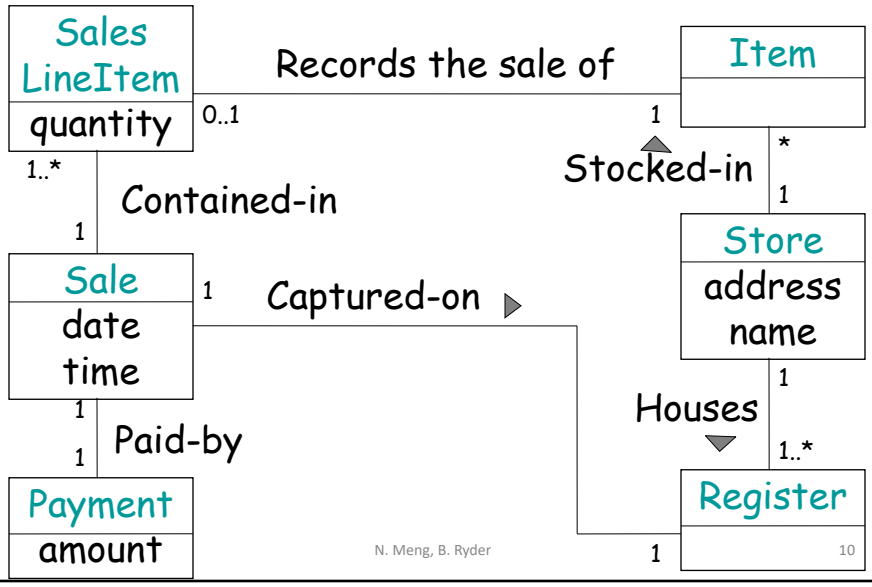
Key Points about UML Class Diagram

- UML is just annotation
- UML class diagram means different things in different contexts
  - Conceptual perspective: description of the domain model
  - Specification perspective: description of software abstractions or components
  - Implementation perspective: description of Java classes

Domain model

- A small set of UML class diagram elements
  - Classes
    - Attributes
    - Operations
  - Relationship
    - Generalization
    - Aggregation
    - Composition
    - Association

A Conceptual Class Diagram



How to Build the Domain Model?

- Step 1: Identify conceptual classes
- Step 2: Decide attributes
- Step 3: Identify associations between classes

Note: Step 1 and 2 may occur together

Step 1: Identify Conceptual Classes

- Reuse or modify existing partial models created by experts
  - "recipes" for well-known problems and domains (e.g., accounting, stock market, …)
- Consider common categories
- Identify nouns and noun phrases from the fully dressed use case