

Getting Your Project Started

Architecture Design & Starting to Code

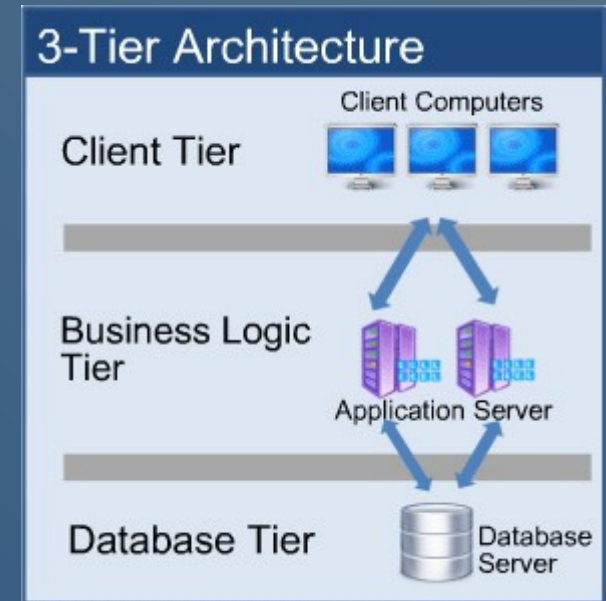
Topics

- 1) How to design a **system's architecture**
- 2) How to do **OOD**
- 3) How to **get started coding**
- 4) **Managing complexity**

Layered Architectures

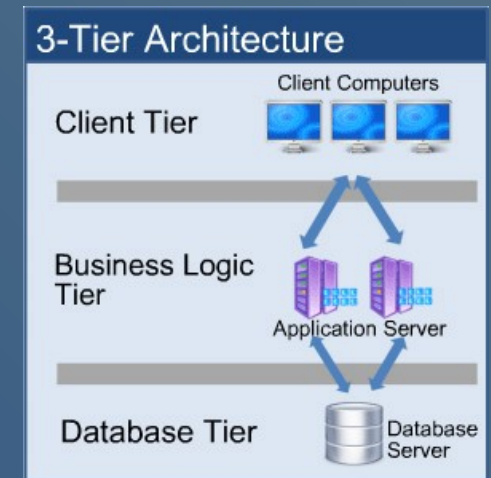
3-Tier Application

- Good “default” 3-tier application architecture:
 - .. **Presentation Layer**
UI displays data, interacts with user
 - .. **Business Logic Layer**
application logic
 - .. **Data Layer**
simple data objects and persistent data storage (database/file system)



3-Tier Application (cont)

- **Advantage:**
 - .. **Better modularity**
 - easier to **understand** and **code**: smaller, simpler self-contained parts
 - easier to **maintain**: changing UI does not change how data is stored
 - easier to **test**: can test business logic and data tiers without UI.



Example functionality

- Super Mario style game functionality
 - Store which direction Mario is facing
 - Draw Mario facing correct direction
 - Accept user input to move Mario left
 - Adjust Mario's position to left
 - Calculate if Mario collided with an enemy

Data

Pres

Pres

Logic

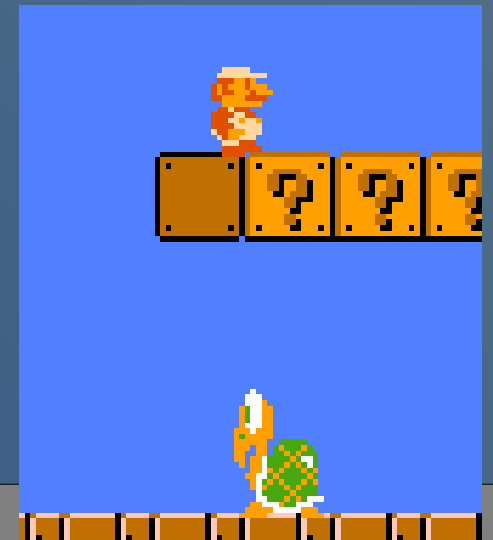
Logic

Options

Pres

Logic

Data



Recommended Steps

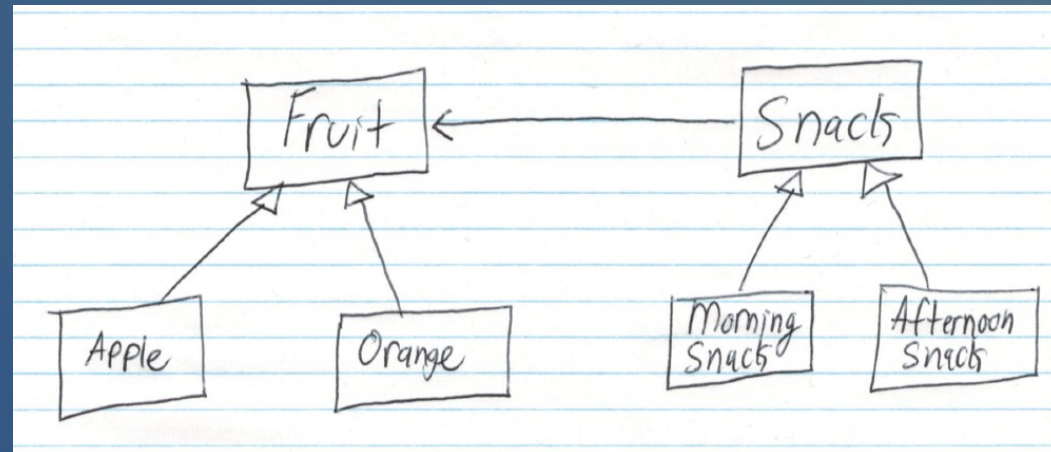
- Identify architecture
 - single app, client-server, cloud based, etc.
- Identify layers (3-Tier)
- CRC cards to analyze high-priority user stories ("Class-Responsibility-Collaborator cards")
 - data classes: what information system process
 - business logic classes: what classes process the data
- high-level UML diagram for class relationships
- make paper UI mockup before UI design/coding

Class Design

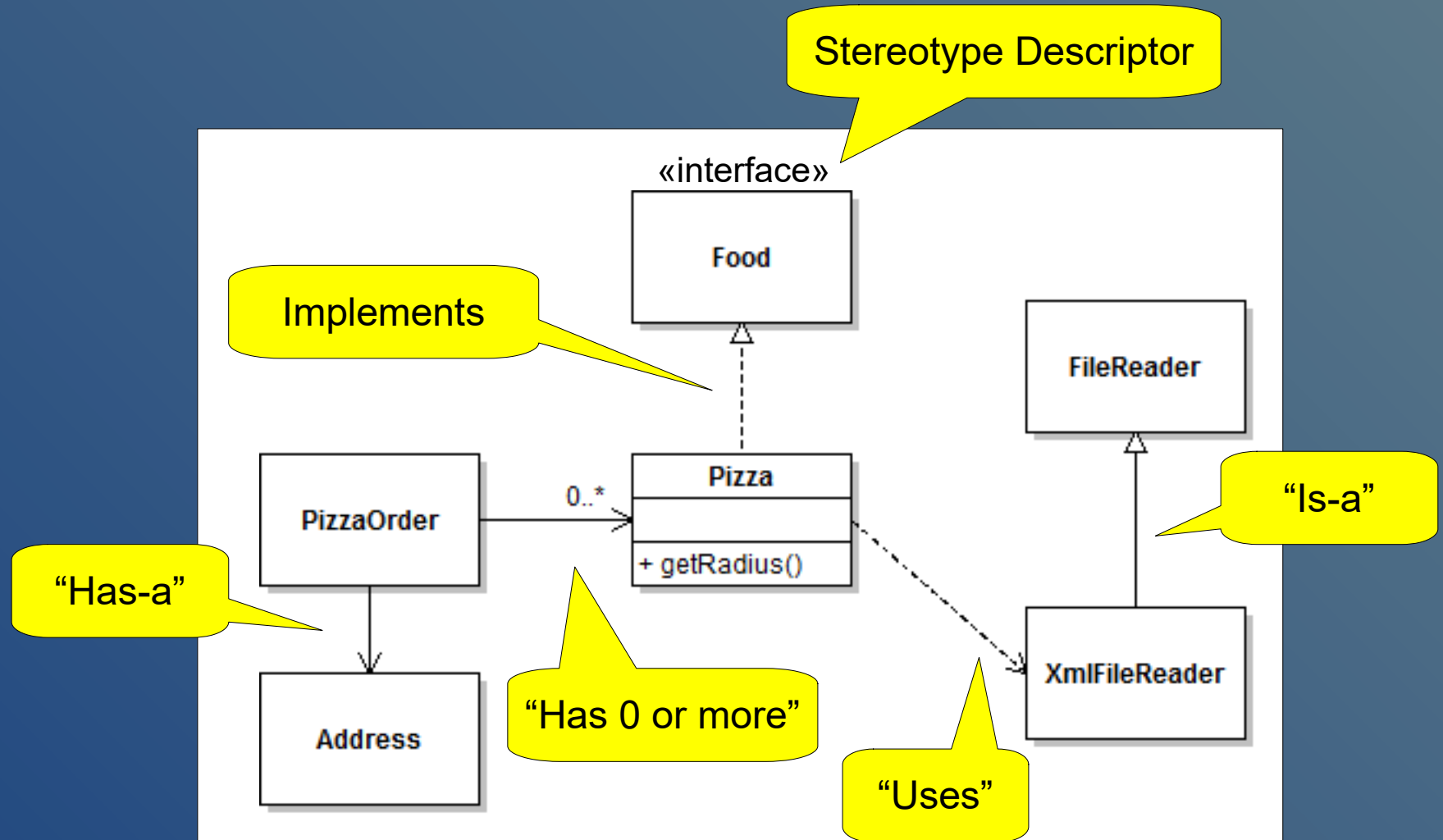
UML

- Draw UML Class Diagrams

- **Informal:** draw on whiteboard to build understanding
- Don't over-design it:
 - identify classes and big features;
 - not method names, data types, parameters,
- Industry mostly uses informal UML



Class Connections



Exercise

- Create a UML class diagram including:
 - Book interface
 - ElectronicBook, PrintBook, HardcoverBook classes
 - Reader uses many books
 - Reader loads books from file via a BookFileReader

- Rest of notes in other PDF