Object Oriented Design

**Learning Objective**

* Apply the CRC (Class Responsibility Collaborator) technique to analyze and design the object-oriented model for a problem.
* Articulate the difference between design and architecture.
* Describe ‘design phase’ as a necessary transition step between problem description and solution implementation.
* Differentiate uses of the word ‘design’:
  + (1) design as phase in development process,
  + (2) design as work-product (UML diagram)
* Describe large scale designs, and small scale designs.
* Explain how qualities are often tradeoffs, balancing competing qualities.
* Demonstrate how to breakdown a problem in terms that a customer can understand.
* Demonstrate using index cards to help represent the breakdown of the problem where each card notes a specific concept (class) and its responsibilities and collaborators (dependencies to other concepts/classes)

**Design Patterns**

**Learning Objectives**

* + Describe the intent, applicability, and consequences of basic **creational design patterns** (e.g., factory method, singleton).
  + Explain the structure of a design pattern using a UML class diagram.
  + Explain the behaviour of a design pattern using a UML sequence diagram
  + Derive a Java realization of a design pattern.

Describe the intent, applicability, and consequences of structural design patterns (e.g., adapter, composite, decorator, proxy).