CS 417/505
Design Patterns

UML Modeling part 3

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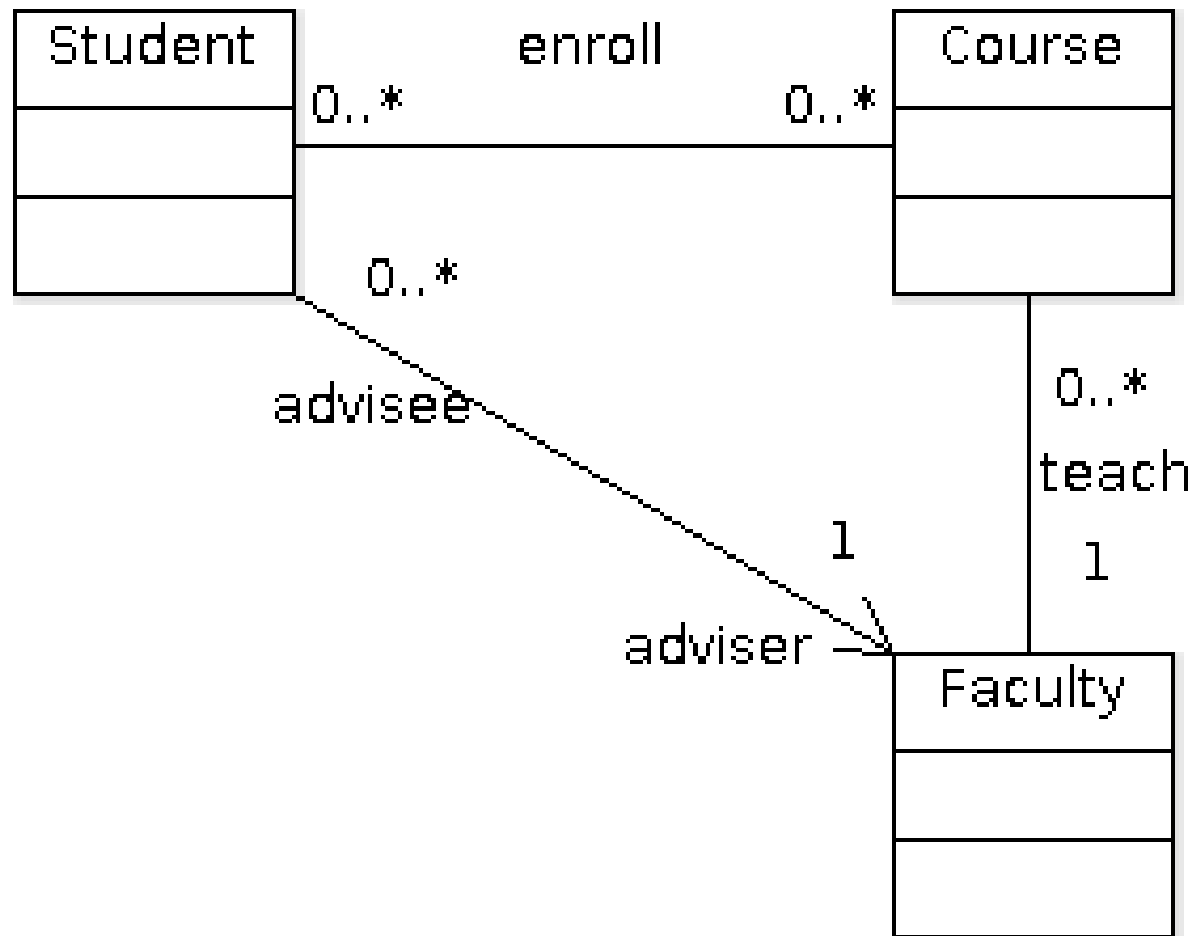Central Connecticut State University

Topics

- Association

- Aggregation

- Composition

- Dependency

Association

- Represents a relationship between classes
    - Role name between classes
    - Multiplicity of relationship between classes
   - Navigability of relationship

Sample association

Aggregation and composition

- Aggregation - special form of association
  - Has-a or part-whole
  - Aggregate class holds on to Component class as part of it
- Composition – stronger form of aggregation
  - The lifetime of the component class is contained by the aggregating class that holds the composite relationship
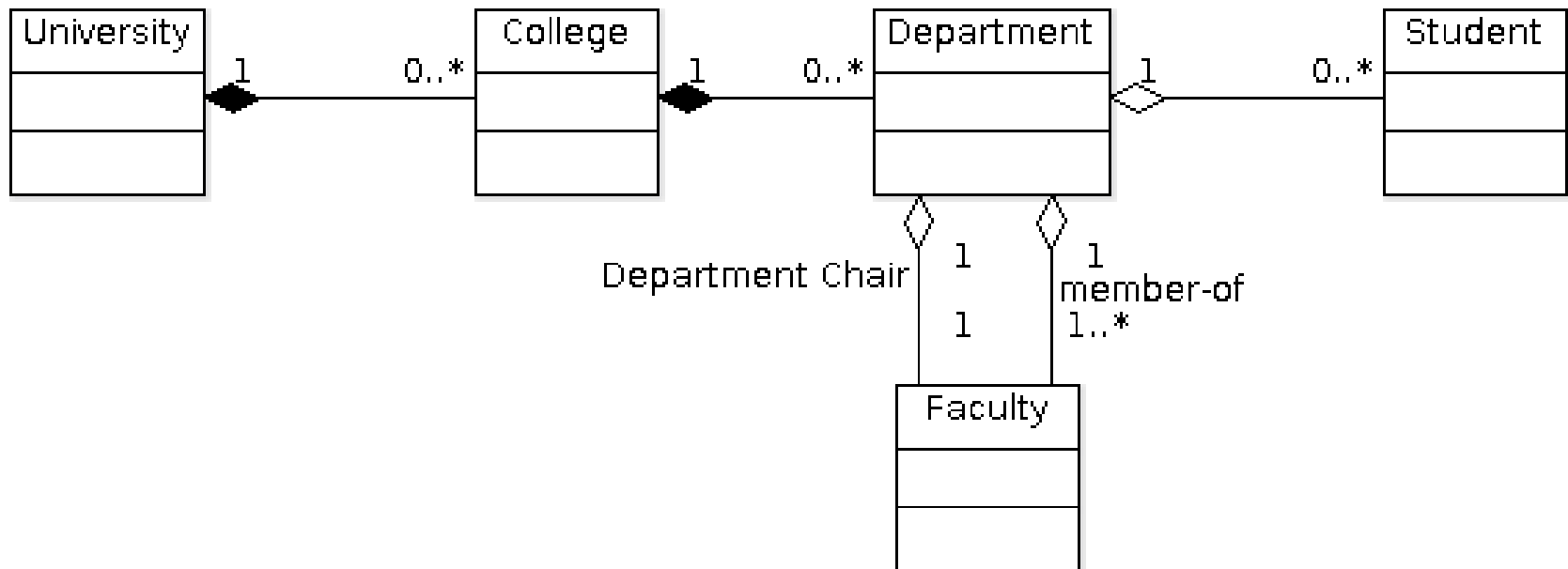
Graphical representation

Aggregate — Component
Name of role
Aggregation
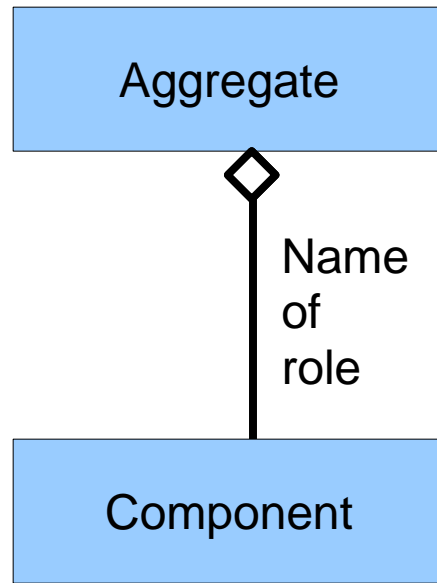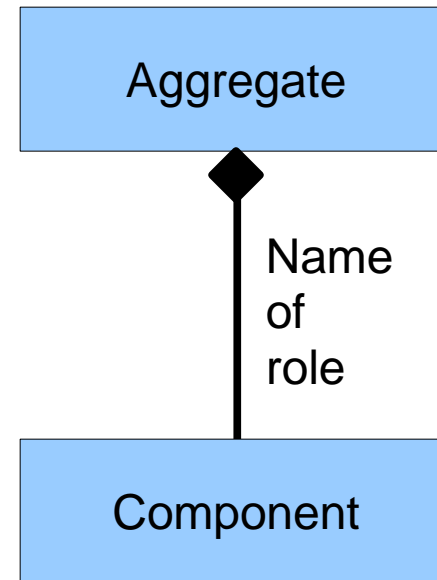
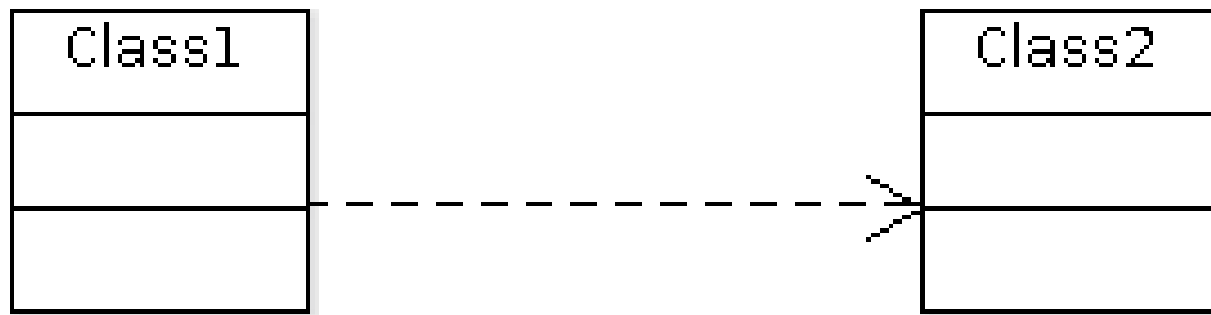Aggregate — Component
Name of role
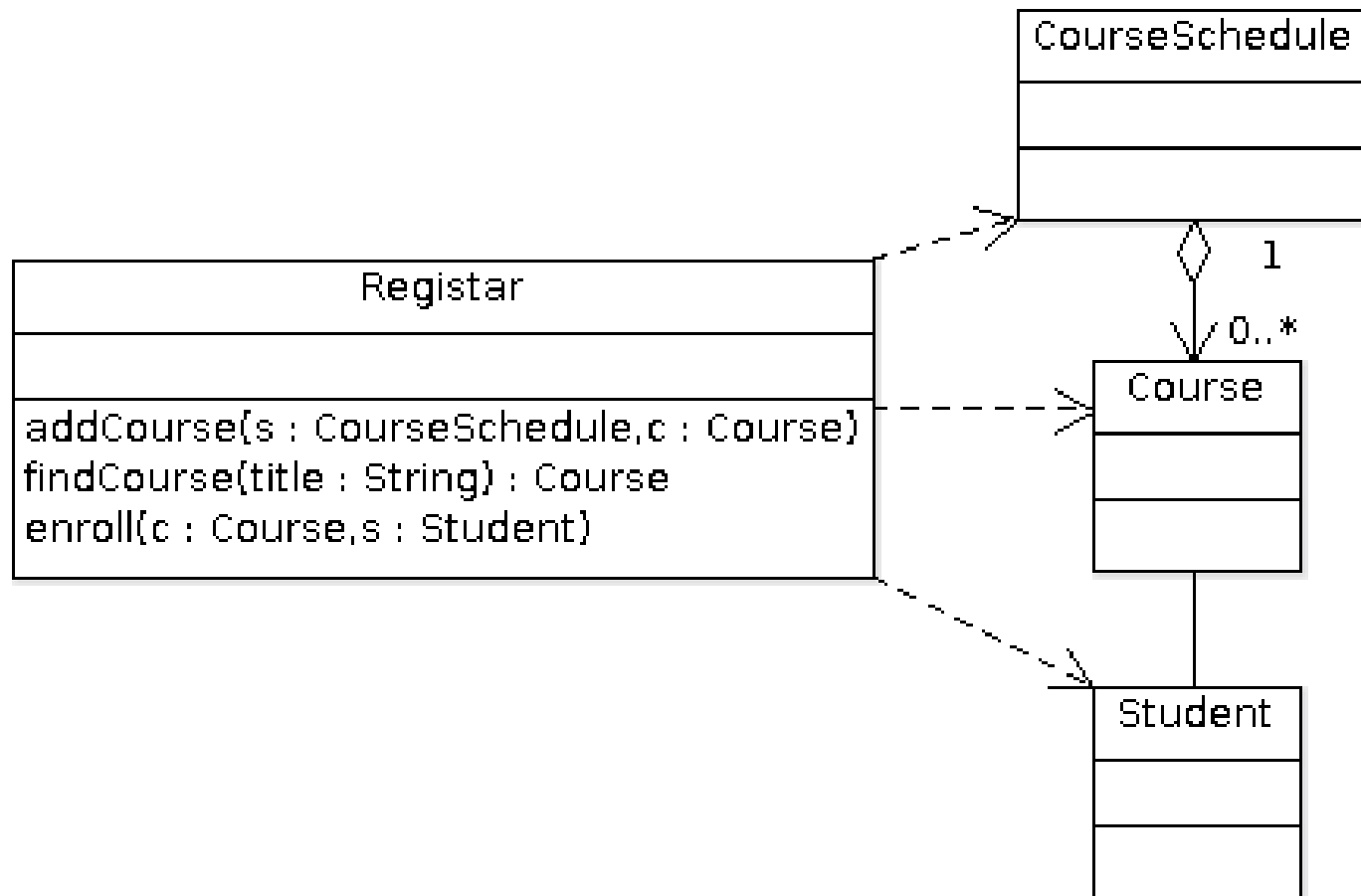Composition

Aggregation example

Dependency

- Represents proper operation of one class dependent on another class

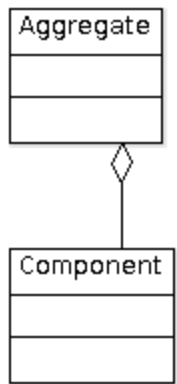- Common form is class being used as parameter or local variable
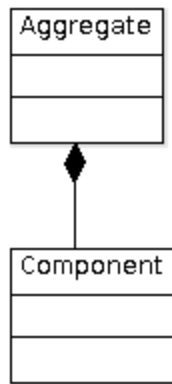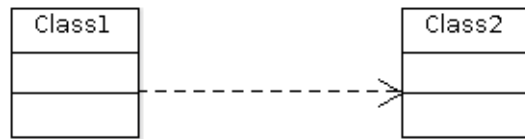
Dependency example

Group work

- Create an object model of a company
  - Multiple departments each with multiple workers
  - A worker can be either an employee or an intern, where the employee and intern classes are mutually exclusive (i.e. Worker should be an interface)
  - Head of each department is a manager
  - Manager is specialization of an employee
  - Employee has 0 or more addresses and the employee has a link to address but not vice versa
  - HumanResources class has operations to create employees and managers and assign them to departments. It also maintains a list of all employees
- Draw the following where applicable:
  - Inheritance, realization, association/aggregation/composition, dependency, numerocity

aggregation

composition

dependency

Association