Relationships between classes

- Once we learn Inheritance we will understand:
- What is UML
- Relationships between classes.
- Association, aggregation & composition.

What is UML

- UML is a standard language for writing software blueprints.
- The UML may be used to visualize, specify, construct and document the artifacts of a software intensive system.
- Defined semantics for each of the graphical symbols.
- Allows for unambiguous specification and for inspection of requirements and designs.
- Allows tools to directly generate code from diagrams - but programmers still has to do some work.
- Provides documentation of products, so allowing auditing and facilitating management.

UML object Models

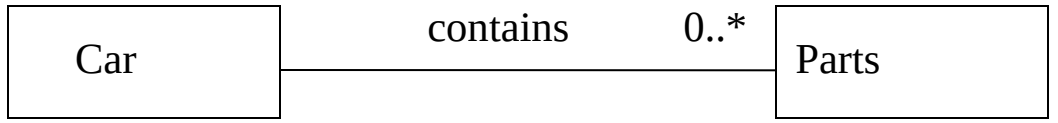
- UML diagrams object models:
- Association, Aggregation, and Composition.
- Association: show a collection of named boxes - indicating classes or types of object. The boxes have lines connecting them called links. Each link is called an association and should model some relationship or connection between the classes. Associations also play roles in classes that
  are often given special names.

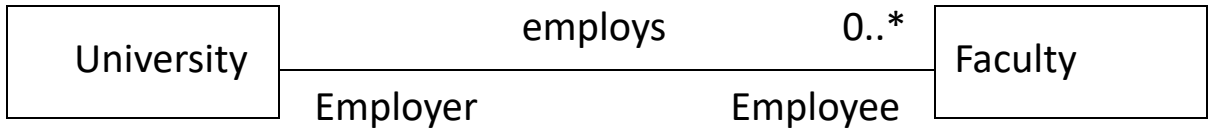
Association

- An association shows a two-way relationship between objects (instances) of two or more classes and requiring special implementation to ensure integrity.
- A particular instance of an association is often called a link.
- Associations between classes are required if the objects need to communicate.
- Associations are often named, and have role-names for each side of the link.

Association

- An association has a name and a numerical specification (multiplicity indication) of how many objects on one side of the association are connected with how many objects on the other side.
- Associations are called use relationships.





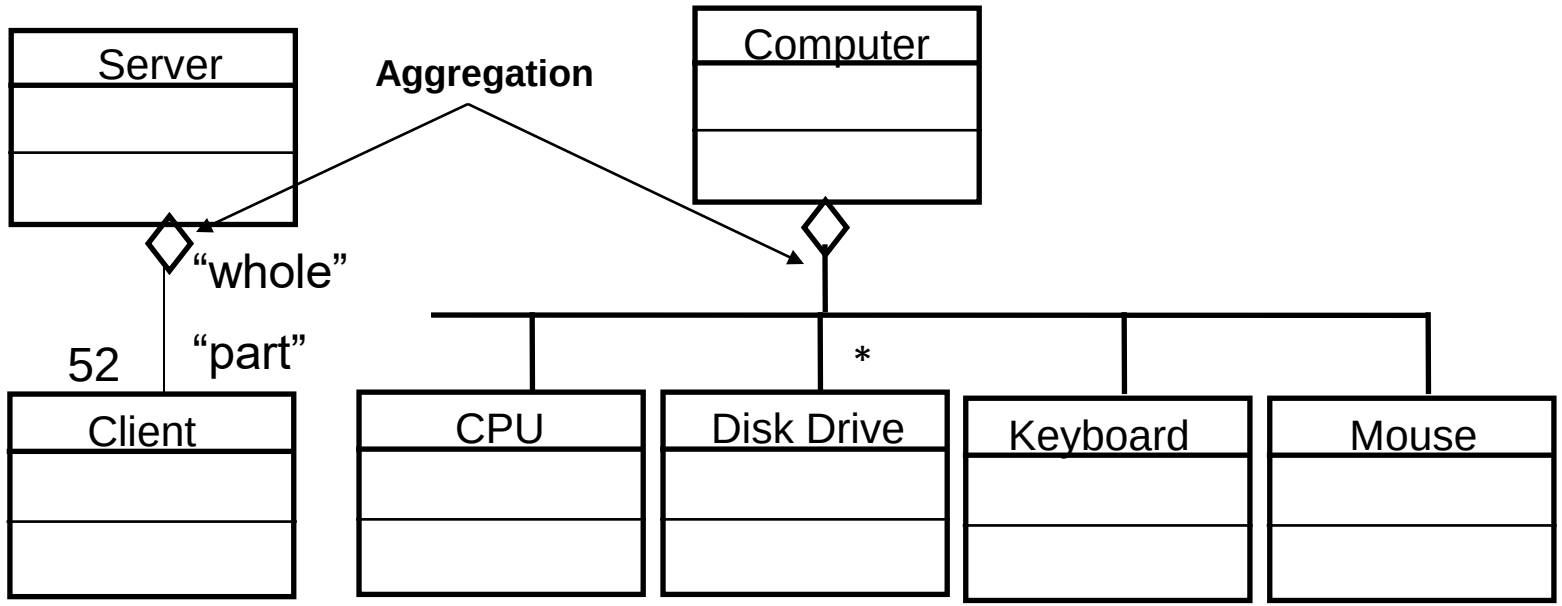
Relationships

- The multiplicity of the association is one to one meaning that for every Company there is one and only one contactPerson and for each contactPerson there is one Company.

Aggregation & Composite

- Special diamond symbol used on “whole” side to indicate aggregation.
- Aggregation is an anti-symmetric that is, if A is part of B, then B is not part of A.
- DO NOT confuse aggregation with generalization
- An essential property of aggregates is that the whole acts as a proxy for its parts.
- A composition is a strict form of aggregation, in which the parts are existence-dependent on the entirely

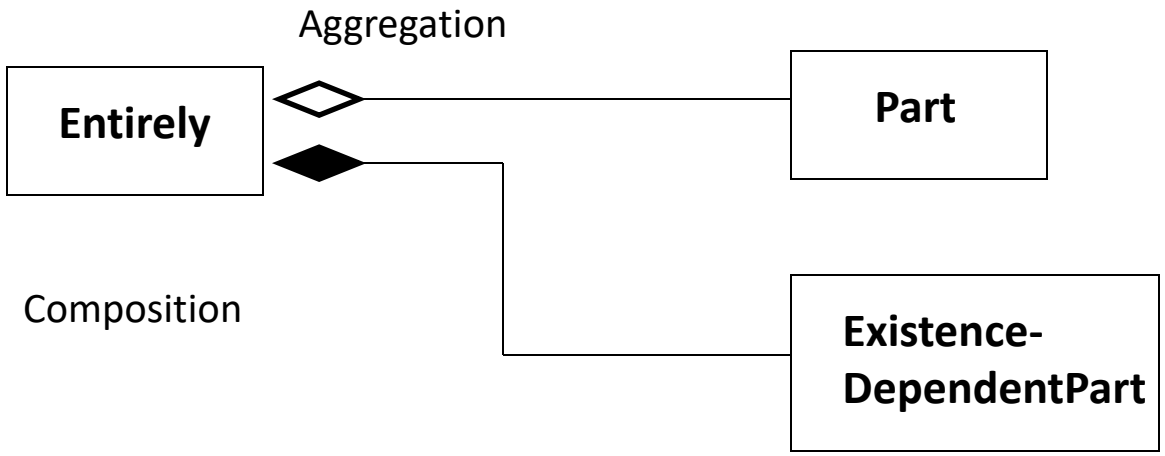
Aggregation & Composite



Composition

- UML provides several notations that can express the physical construction of a class. The filled in diamond is often used when a class contain other objects within them as parts or components. The composition association is represented by the solid diamond.

Aggregation & Composite



Summary

- We learned and focused on:
  - UML design.
  - Relationships between classes.
  - Association
  - Aggregation
  - Composition.