Aggregation

- A-part-of relationship
- Class comprised of many component classes
- Strong and special form of an binary association
- OMT symbol is a hollow diamond
- It is defined as whole-part relationship between an aggregate, the whole and its parts

Aggregation (cont.)

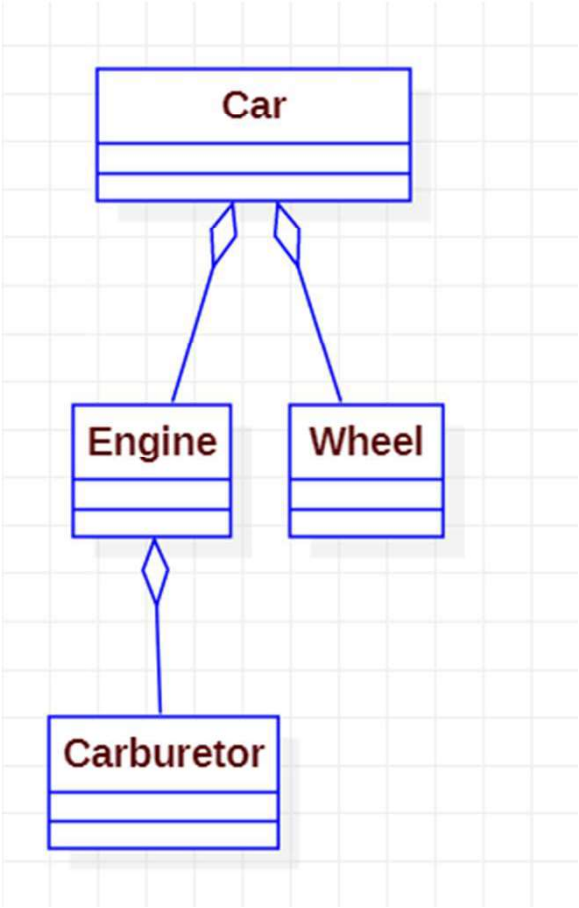
Two major properties of a-part-of relationship

✓ Transitivity

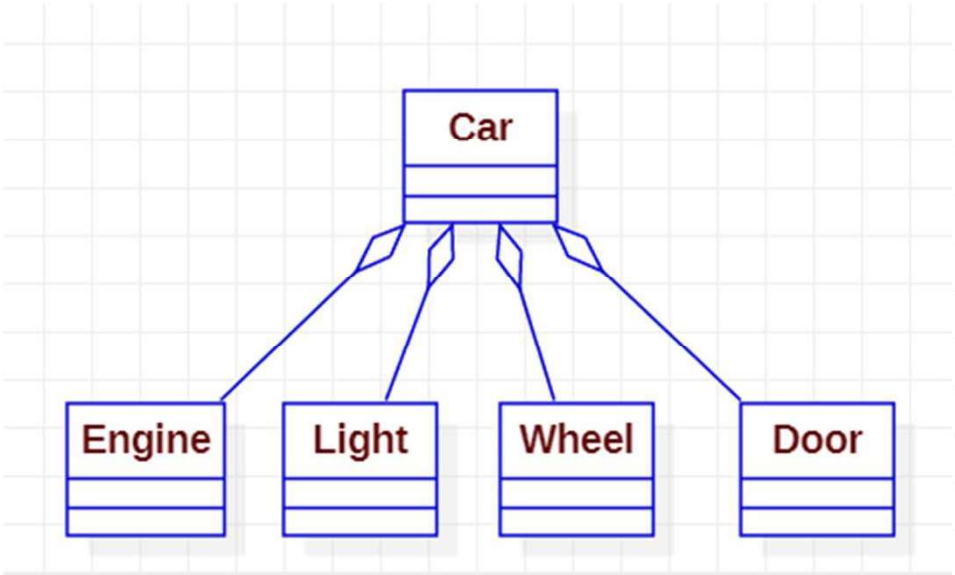
If A is part of B, B is part of C; then A is part of C

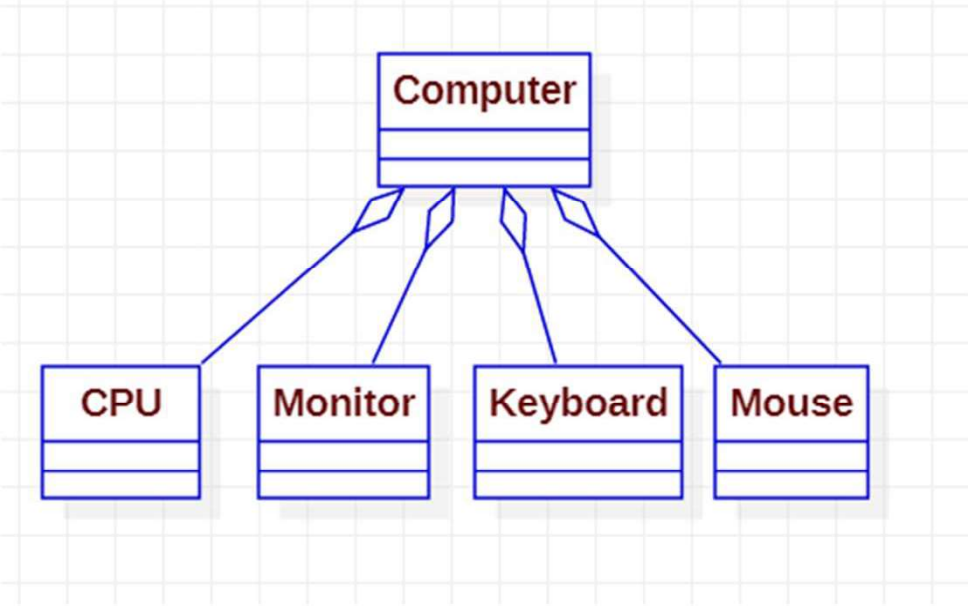
✓ Antisymmetric

✓ - If A is part of B, then B is not part of A



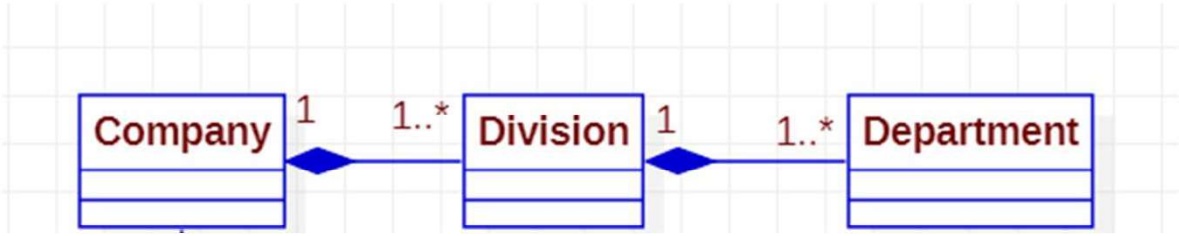
Aggregation Example

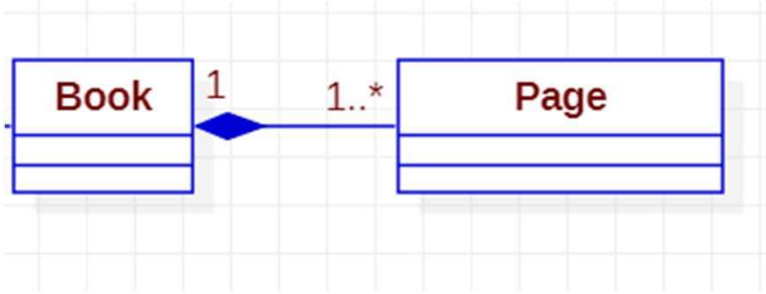




Composition

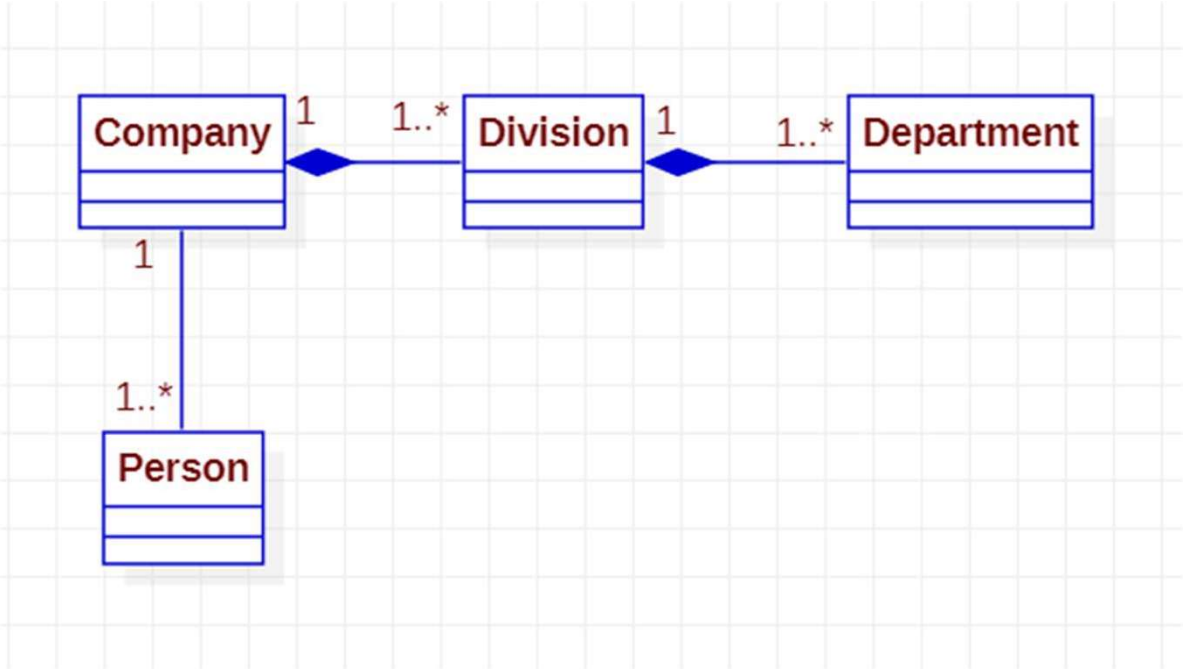
- It is a strong form of aggregation
- A filled diamond represents the strong form of an aggregation
- Also known as the a-part-of or a part-whole relationship





Aggregation Vs Association

- If two objects are tightly bound by a part-whole relationship, it is an aggregation
- If two independent objects are linked, it is an association



Aggregation Vs Association (cont.)

Some test include

- ✓ Would you use the phrase part-of?
- ✓ Do some operations on the whole automatically apply to its parts?
- ✓ Do some attribute values propagate from the whole to all or some parts?
- ✓ Is there asymmetry to the association , where one class is subordinate to another?

Aggregation Vs Association (cont.)

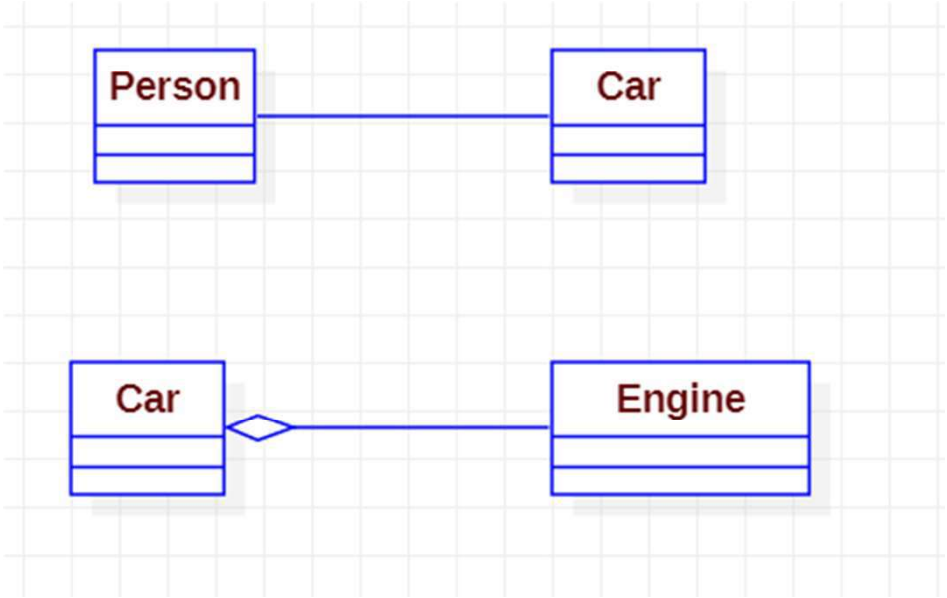
Aggregation

- Dependent concept.
- Tightly-bound form of relationship.
- One object class is subordinate to the other.
- Some operations and attributes automatically applied from whole to part object classes.

Association

- Independent concept.
- Loosely-bound form of relationship.
- One object class is not subordinate to the other.
- Operations and attributes are unique with independent classes.

Aggregation Vs Association (cont.)

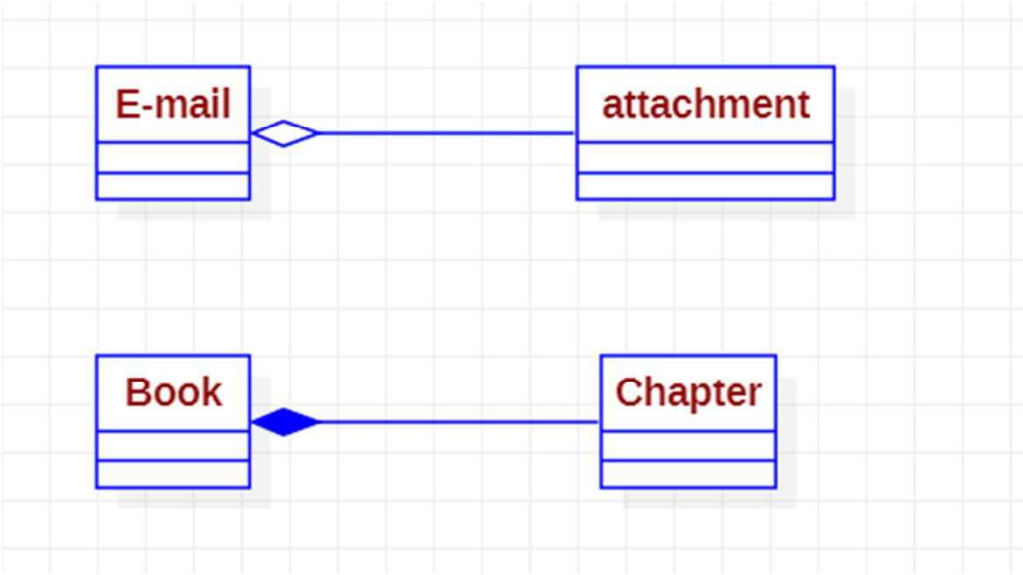


Aggregation Vs Composition

- UML has two forms of part-whole relationships

✓ General form- Aggregation

✓ Restrictive form- Composition



Aggregation Vs Generalization

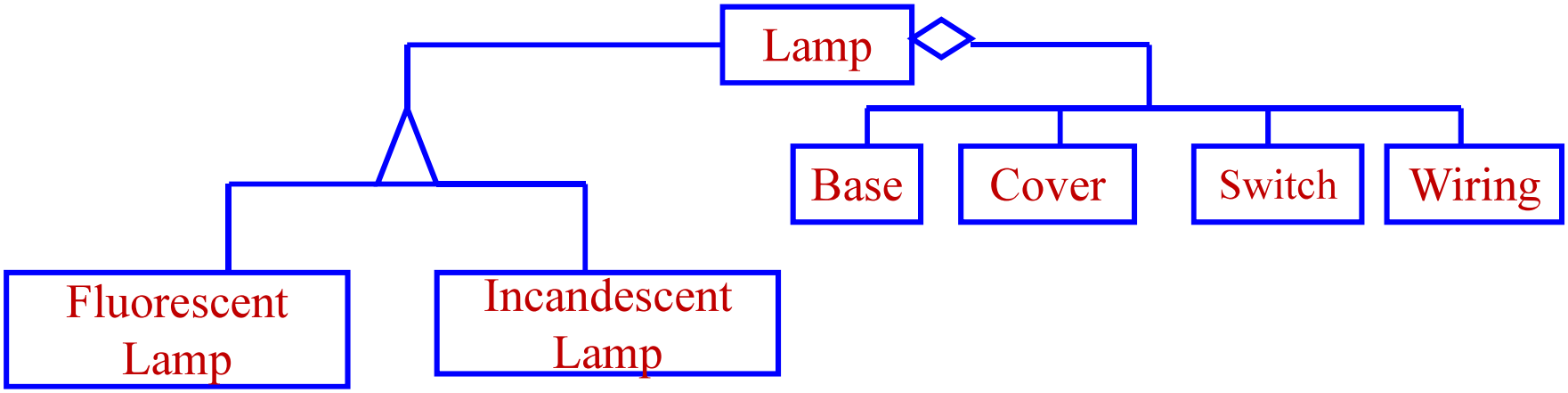
Aggregation

- Aggregation relates instances.
- Aggregation is often called "a-part-of" relationship.
- "And" relationship between object classes.
- A hollow diamond symbol represents an aggregation
- One object contain other objects

Generalization

- Generalization relates classes.
- Generalization is often called "a-kind-of" or "is-a" relationship.
- "Or" relationship between object classes.
- A hollow triangle symbol represents an aggregation
- Relationship between a class and refined version of it

Aggregation Vs Generalization (cont.)



Propagation of Operations

- Propagation also called triggering
- An operation to a network of objects when the operation is applied to some starting object
- Propagation of operations to parts is often a good indicator of aggregation