5/09/2023 Relationship between classes

- Low level of accessibility = private
- High level of accessibility = public

Relationship between classes

Three ways in which the class relationship can be established is :

- Generalization/specialization = Inheritance
- Whole/part = Aggregation and composition
- Peer to peer relation = association

Combinations of relationships

Total six combination of relationships :

1. Association
2. Inheritance
3. Aggregation
4. Using
5. Instantiation
6. Meta-class

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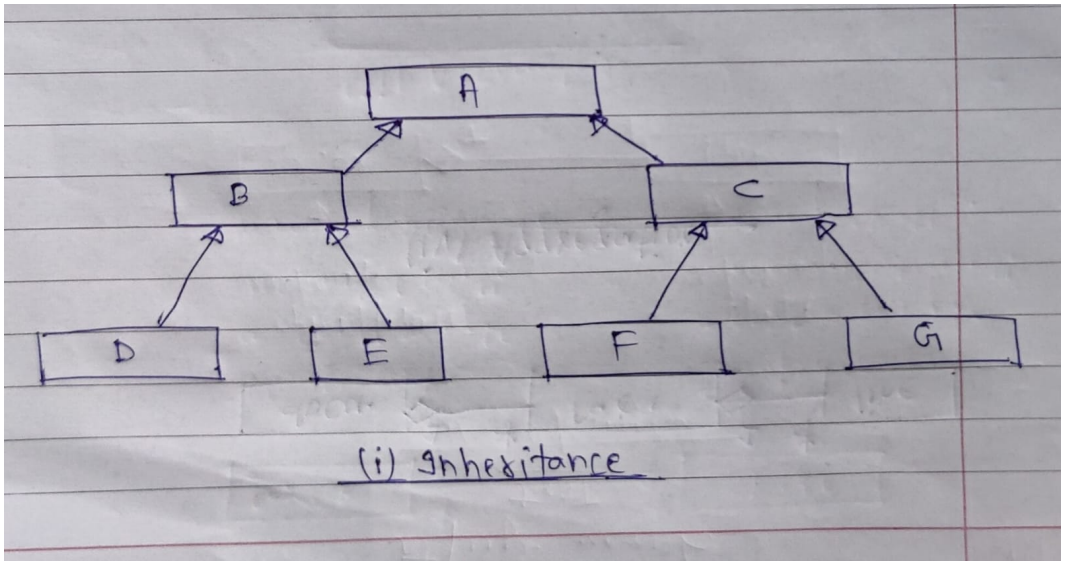
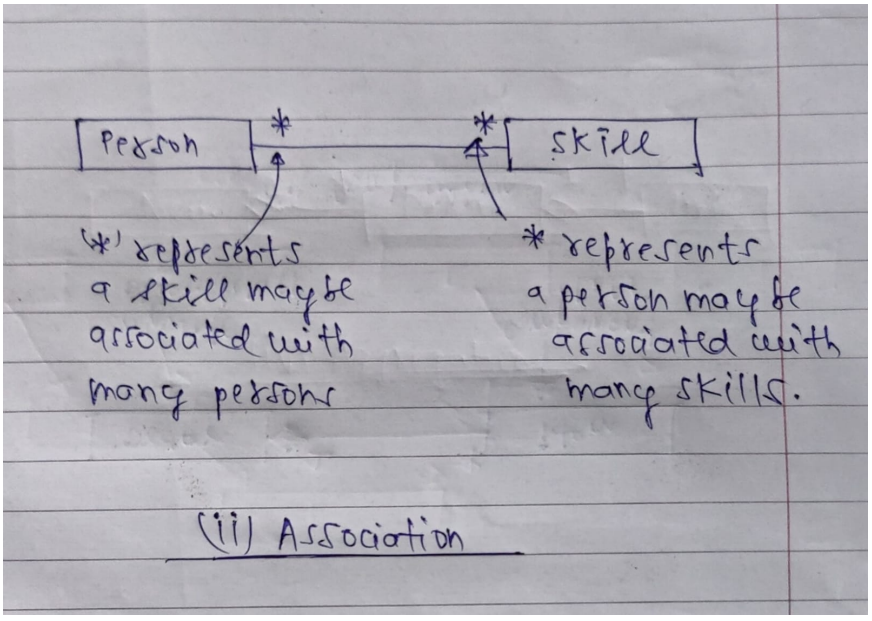
1. **Inheritance :**



2. **Association :**

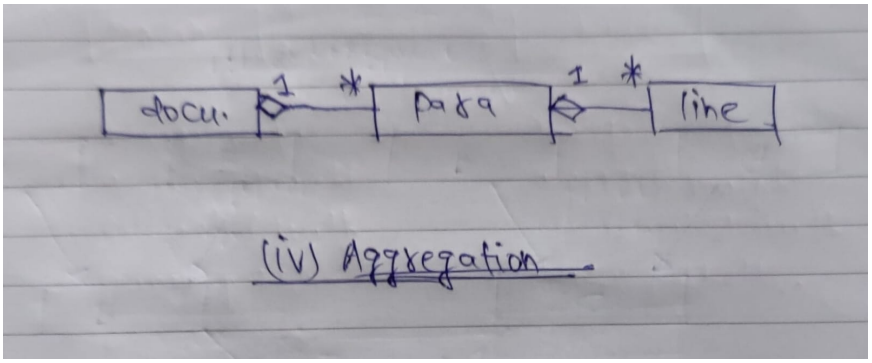


- Only a sematic dependency, not functional
- One object must know the address of other object
- Recursive Association = A class associated to itself.
- There is no object-instance relationship.
- Usually binary in nature (binary association)
- For fulfilling functional requirements, we will associate the two classes.

Link and Association :

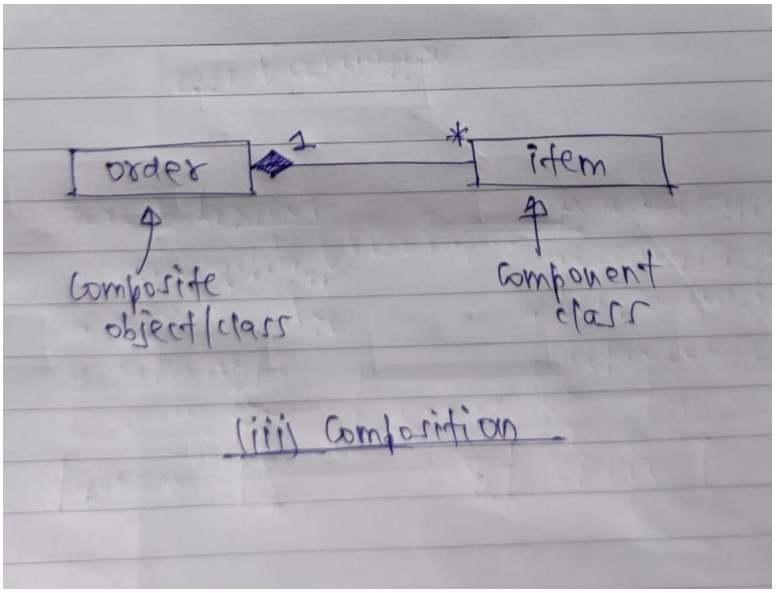
- Link is the instance of association
- Dynamically created and destroyed during run-time.
- Exists between two or more objects

3. **Aggregation : (whole-part) :**



- Weak form of relationship in which lifetime of the two will be independent and physical containment not guaranteed.
- ***Cannot be reflexive or symmetric*** (cannot be recursive) in nature.
- ***Is transitive in nature*** ⇒ if A aggregated with B and B aggregated with C, then A and C also have aggregation.

4. **Composition :**



- A form of aggregation
- Strong relationship, physical containment always present and lifelines are related.
- Composite and component objects lifetimes are related to each other.
