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Association in Java

=> HAS-A Relationship (Association) :-

-> Association is relation between two separate classes which establishes through their objects

-> Association has 4 types :-

1. One-to-One Association

2. One-to-Many Association

3. Many-to-One Association

4. Many-to-Many Association

-> Association has 2 forms :-

1. Composition

2. Aggregation

=> One-to-One Association :-

-> Real World Example :-

1. One person has one passport

2. One employee has one employee id

3. One student has one roll no

-> It is a relation between entities where one instance of an entity should be mapped only to one instance of another entity

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=> One-to-Many Association :-

-> Real World Example :-

1. One person can have multiple phone numbers

2. One student can have multiple courses

3. One person can have multiple bank accounts

4. One machine can have multiple functionalities like tea, coffee etc

5. One customer can have multiple orders

6. One class can have multiple students

-> It is the relation between entity classes where one instance of an entity should be mapped with multiple instance of another entity

=> Many-to-One Association :-

-> Real World Example :-

1. Many colleges can associate with single university

2. Multiple cities exist in one state

3. Many ports can exist in one extention

4. Multiple students can have one branch

-> It is a relation between entities where multiple instances of an entity should be mapped with exactly one instance of another entity

=> Many-to-Many Association

-> Real World Example :-

1. Multiple customers can buy multiple products and multiple products can be bought by multiple customers
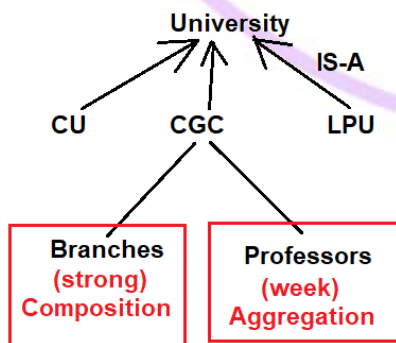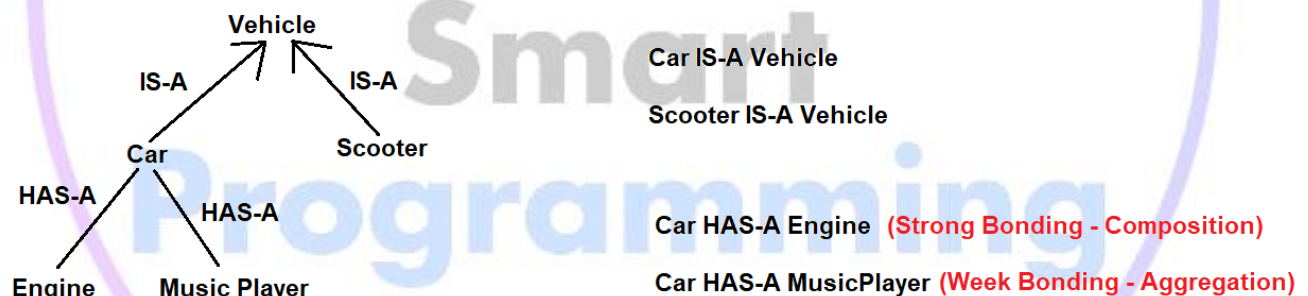
2. Multiple students can associate with multiple teachers and multiple teachers are associated with multiple students

3. Multiple students can learn multiple languages

-> It is relation between entities where multiple instances of an entity should be mapped with multiple instances of another entity

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-> Association has 2 forms :-

1. Composition (strong bonding)

2. Aggregation (week bonding)

Car IS-A Vehicle

Scooter IS-A Vehicle

Car HAS-A Engine (Strong Bonding - Composition)

Car HAS-A MusicPlayer (Week Bonding - Aggregation)

=> Difference between Composition & Aggregation :-

1. Real World Example :-

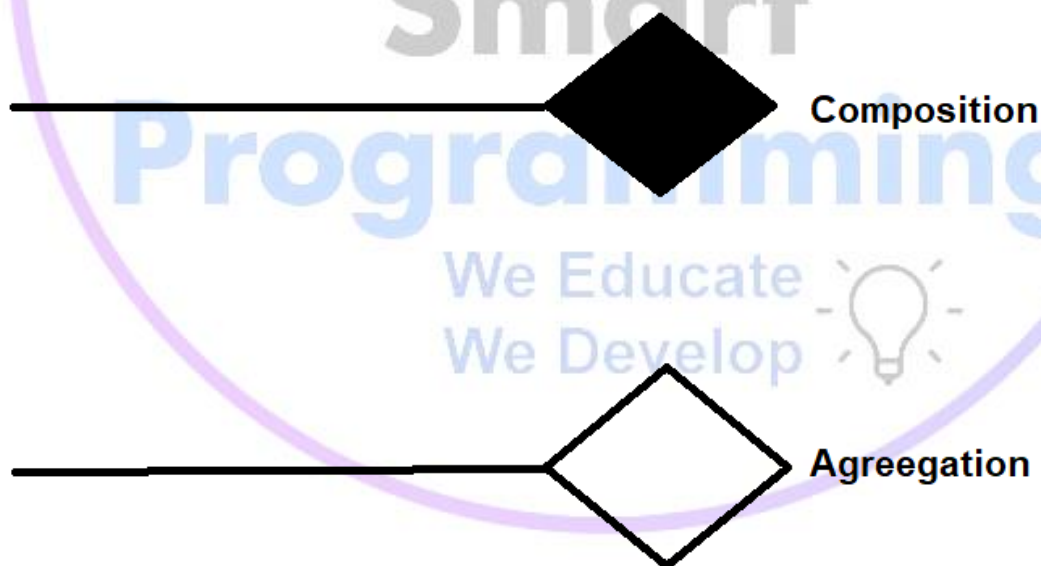   Composition :- Car HAS-A Engine

   Aggregation :- Car HAS-A MusicPlayer

2. UML Diagram :-

   Composition :- Car ------<filled> Engine

   Aggregation :- Car ------<> MusicPlayer

Composition

Agreegation

3. Composition :- part-of

   Aggregation :- has

4. Type of bonding :-

   Composition :- Strong Bonding

   Aggregation :- Week Bonding

=> Where we have to use IS-A relation and HAS-A relation

If we want to inherit all the properties of parent class into child class then we can use IS-A relation but if we want only partial inherit then we have to use HAS-A relation

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