OOA - classification theory

- Object-Oriented Analysis (OOA) classification theory is a method used in software engineering and system design to model and categorize real-world objects and their interactions in a system. It is part of the object-oriented methodology, which emphasizes objects, classes, and the relationships between them to define the system.

- Here are the key components of OOA classification:

1. Objects : These are instances of classes, representing real-world entities or concepts in the problem domain.
2. Classes : A class defines the blueprint for objects and encapsulates attributes and behaviors that are shared by objects of the same type
3. Attributes : characteristics or properties of objects, representing the state of an object.
4. Methods : Functions or operations associated with a class, defining the behavior of its objects.
5. Relationships :
   i) Association : A connection between two objects (e.g., one object referencing another).
   ii) Inheritance : A hierarchical relationship where one class is derived from another (e.g., subclass inheriting properties and behaviors from a superclass)

iii) Aggregation : A special type of association that represents a "whole-part" relationship.

iv) Composition : A stronger form of aggregation where the the lifecycle of the part is dependent on the whole.

6. Encapsulation : Hiding internal details of an object and only exposing necessary functionality, ensuring modularity and reducing complexity.

7. Abstraction : Simplifying complex systems by focusing on high-level functionality and ignoring unnecessary details.

- OOA classification is often the first step in object-oriented software development, helping analysts to create a domain model that accurately reflects the problem space. It serves as a foundation for the subsequent stages, such as Object-Oriented Design (OOD) and Object Oriented Programming (OOP).
- The goal is to ensure that the system is both flexible & adaptable to changes by representing real-world entities in a way that is both understandable and maintainable.