



LISBON
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Objects Oriented approach

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Traditional Perspective

- The traditional perspective in software development had adopted is algorithm perspective.
- In this view, the main software building block are procedures or functions

Object oriented Approach

The main structural components of all systems are:

- Objects
- Class Objects

Main Concepts

- Classes,
- Objects, and
- Instances

Object

- Objects represent an entity and the basic building block.
- Object is something that takes up space in the real or conceptual world with which somebody may do things (Booch et al . 1999)
- The objects have :
 - Name (or ID)
 - state
 - Operations (or behavior)

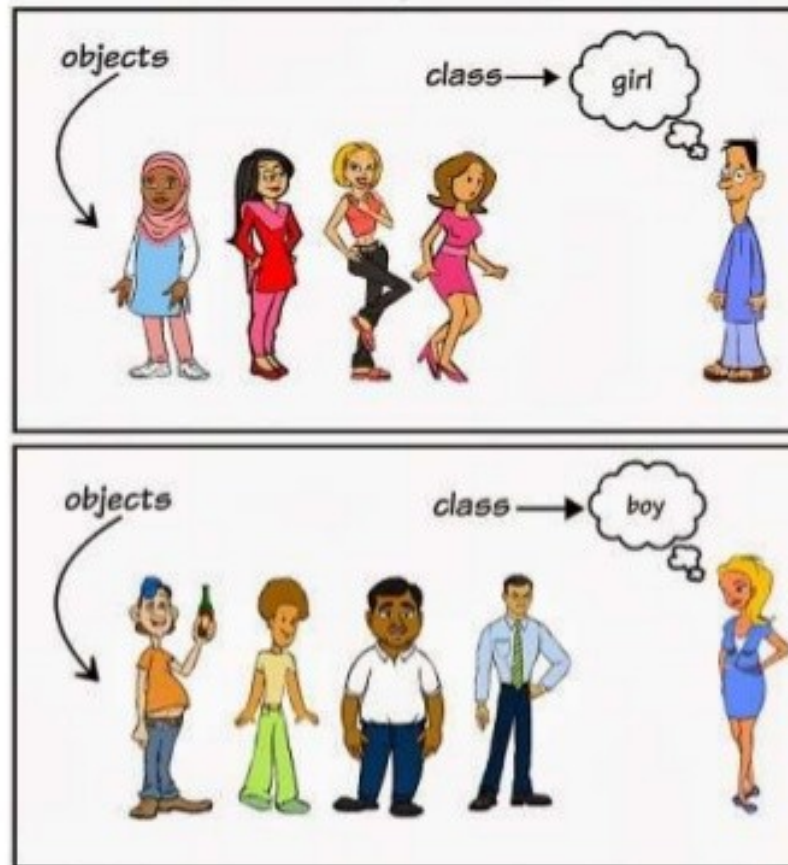
Object

- Name (ID) - The entire object must have a name that will differentiate from other objects in a context (eg my calculator)
- State - An object has state, which involves the object's properties together with the values of these properties (eg connected calculator)
- Operations (behavior) - can do something with the object or the object can do something with another object (eg calculator does sums)

Class

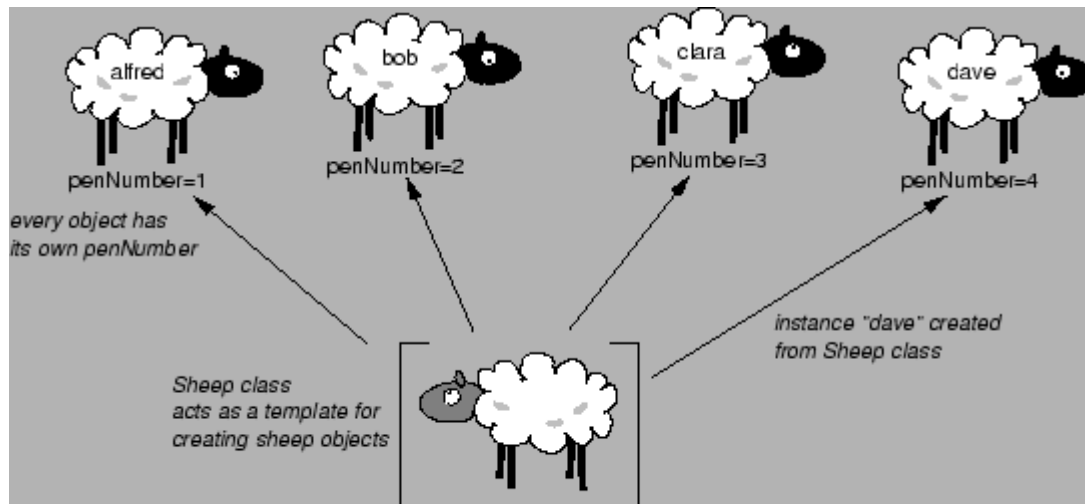
- A class is the description of a set of objects that share the same attributes, operations, relationships and semantics. (Eg calculators).
- Class is the blue print of an object.

Object and Class



Instance

- An object is an instance of a class.
- It is a concrete manifestation of an abstraction .
(Eg " my calculator" is an instance of the class "calculating machines ") .

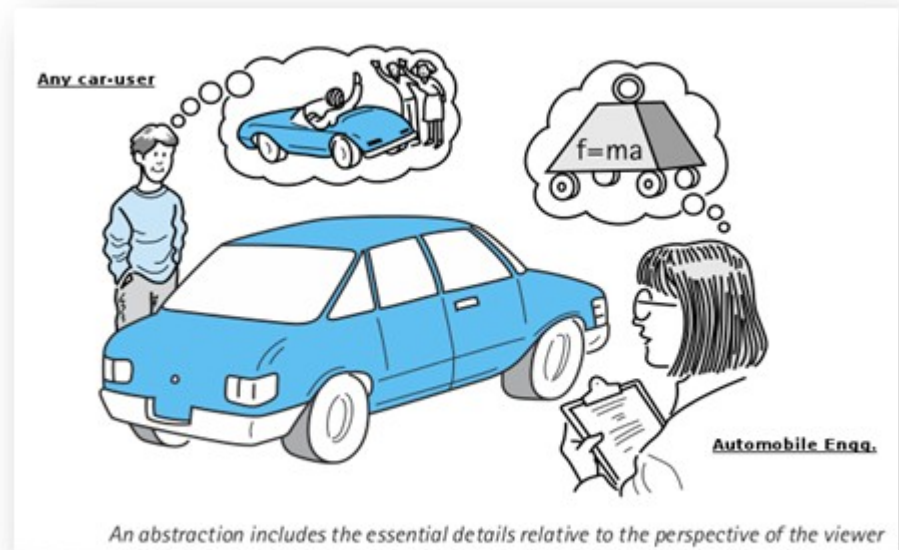


Main characteristics of the approach

- The object oriented approach has as main characteristics:
 - Abstraction
 - Encapsulation
 - Inheritance

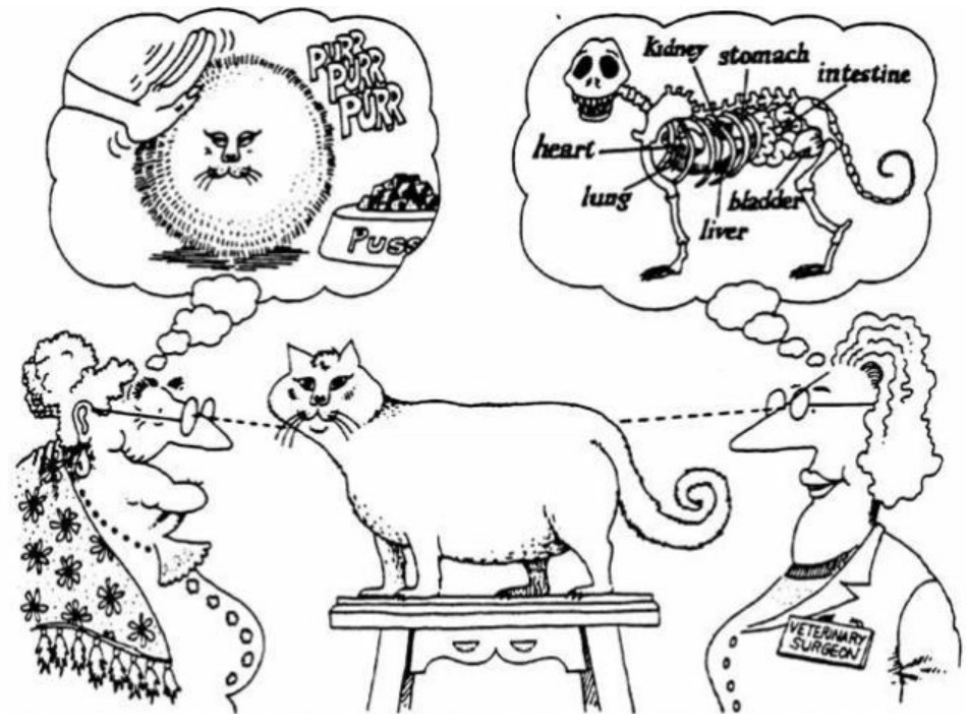
Abstraction

- Abstraction is a principle which consists of ignoring the aspects of a subject that is not relevant for the present purpose, in order to concentrate on in those aspects that are really relevant .



Abstraction

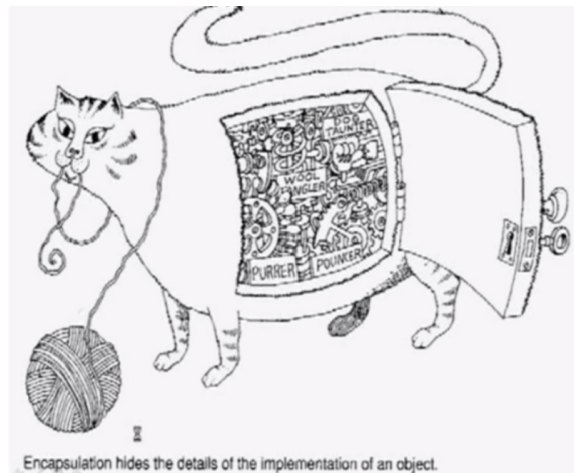
- Abstraction is the concise representation of a more complex object, focusing on the essential characteristics of the object .
- Good abstraction:
 - Appropriate (If there is a real need can be satisfied)
 - appropriate level



Abstraction focuses upon the essential characteristics of some object, relative to the perspective of the viewer.

Encapsulation

- Encapsulation is the mechanism of hiding the implementation of the object, so that other system components do not have access to what is happening inside the object.



Encapsulation

- This concept is associated with modularity , consisting in decomposing a system in a cohesive set of connected modules.
- Encapsulation is the mechanism of binding the data together and hiding them from outside world.
- Objects interact by message.

Inheritance

- Inheritance is a mechanism that allows an object to incorporate all or part of the definitions of another object as part of itself (eg " doctor " and " optometrist ").
- Inheritance is the mechanism of making new classes from existing one.

