

Methodologies And Modeling Of Software Development

Unit 2: SOFTWARE MODELING 2.1 UML Concepts



The Unified Modeling Language (UML)



The Unified Modeling Language (UML) is the most widely known and widely used software system modeling language today; it is backed by the Object Management Group (OMG).

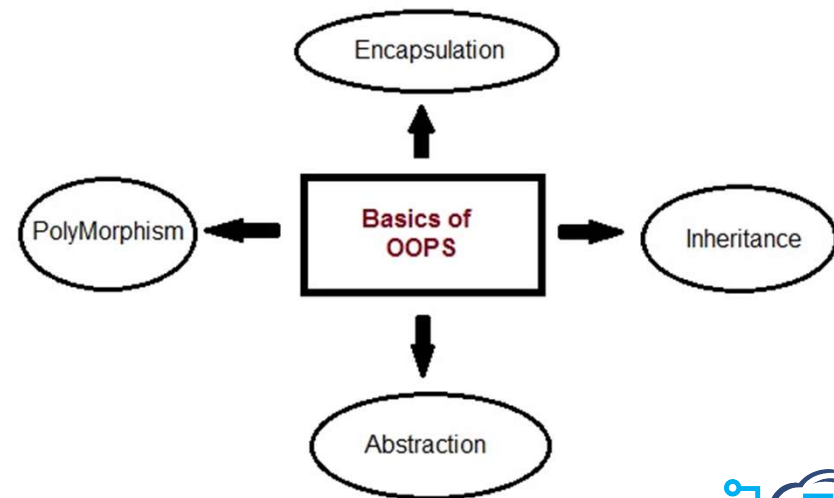
It is a graphic language to visualize, specify, build and document a system. UML offers a standard for describing a "blueprint" of the system (model), including conceptual aspects such as processes, system functions, and concrete aspects such as programming language expressions, database schemas, and recycled compounds.



What is OOA?



Object Oriented Analysis is a analysis paradigm, which involves seeing everything as an object. It allow us to gain reusability of code, which is relationated to 4 concepts



What is an object?

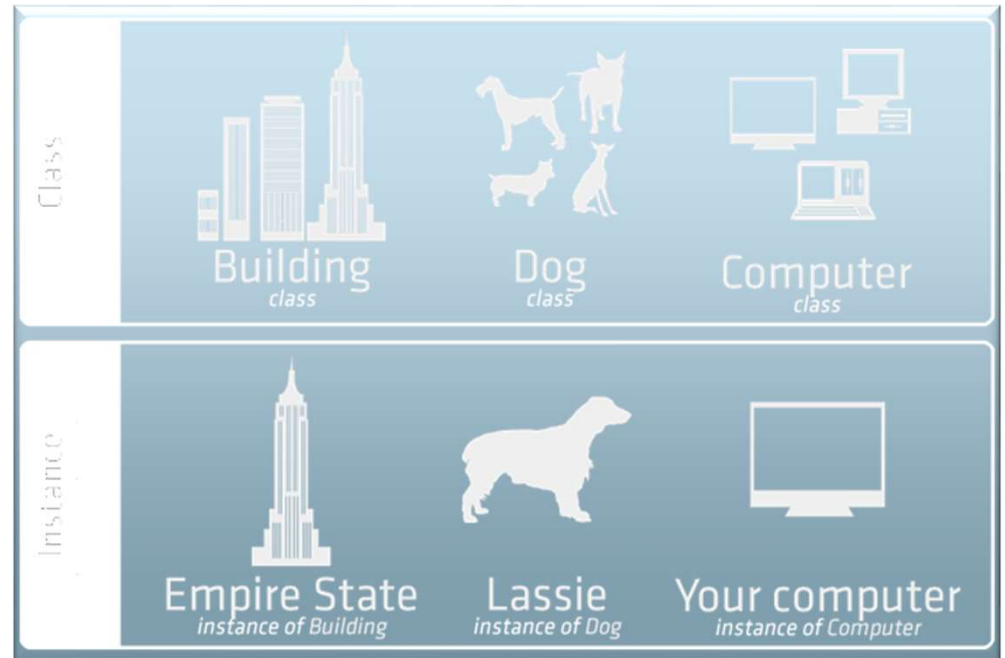
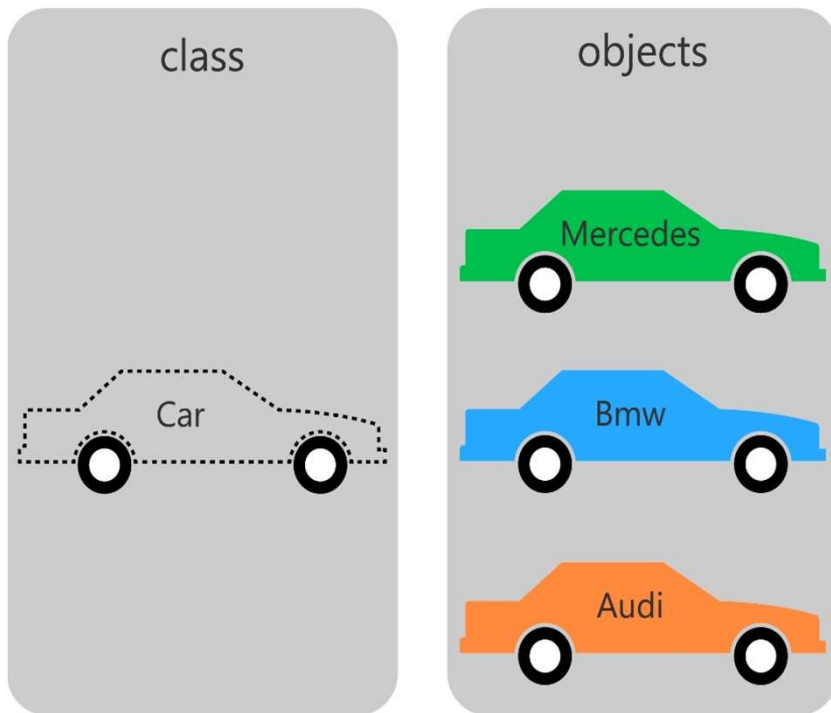
Object means a real word entity such as a shoe, a rubik game, a cell phone, a computer, etc.

An object can be considered a "thing" that can perform a set of related activities. The set of activities that the object performs defines the object's behavior. For example, the Hand (object) can grip something, or a Student(object) can give their name or address.



What is a class?

A class is simply a representation of a type of object. It is the template that describes the details of an object. A class is the template from which the individual objects are created. Class is composed of three things: a name, attributes, and operations.



What is an attribute?

It's a property of an object, which defines something about it. It is used and modified with the methods.



Car

Properties

- Color : Orange
- Wheels : 4
- Doors : 2

Methods

- Steer
- Accelerate
- Brake



Auto-Rickshaw

Properties

- Color : Green/Yellow
- Wheels : 3
- Doors : 0

Methods

- Steer
- Accelerate
- Brake



Bike

Properties

- Color : Blue
- Wheels : 2
- Doors : 0

Methods

- Steer
- Accelerate
- Brake

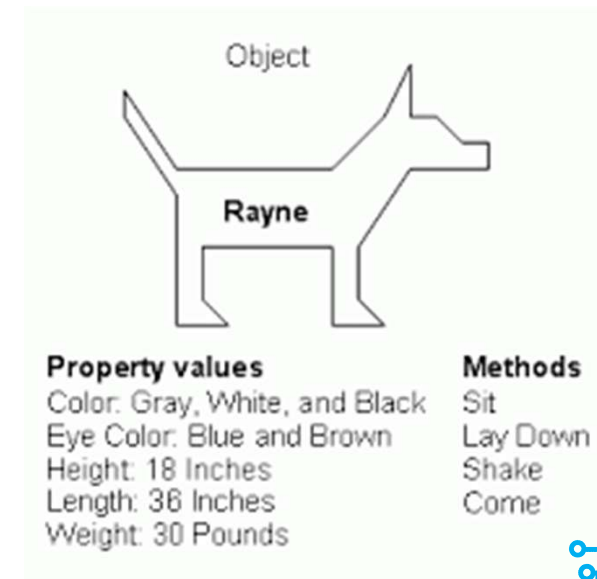
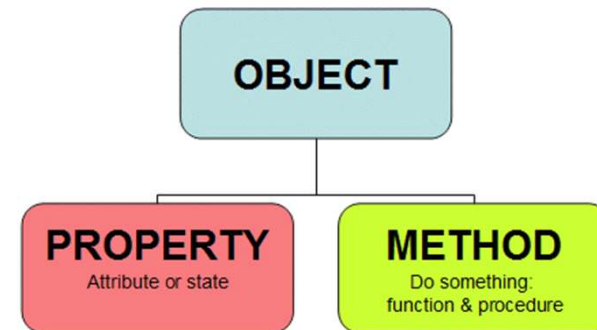


What is a method?

It's the action WHICH the object can do.

Once you have created objects, you want them to be able to do something. This is where methods come in.

A method in object-oriented programming is a procedure associated with a class.

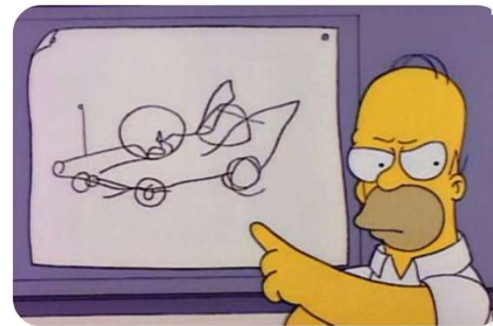


What is abstraction?

Hiding internal details and showing functionality is known as abstraction.

Abstraction is essential in the construction of programs. It places the emphasis on what an object is or does rather than how it is represented or how it works.

Abstracción



Énfasis en el
¿qué hace? mas
que en el ¿cómo
lo hace?



What is polymorphism?

When one task is performed or made by different ways.

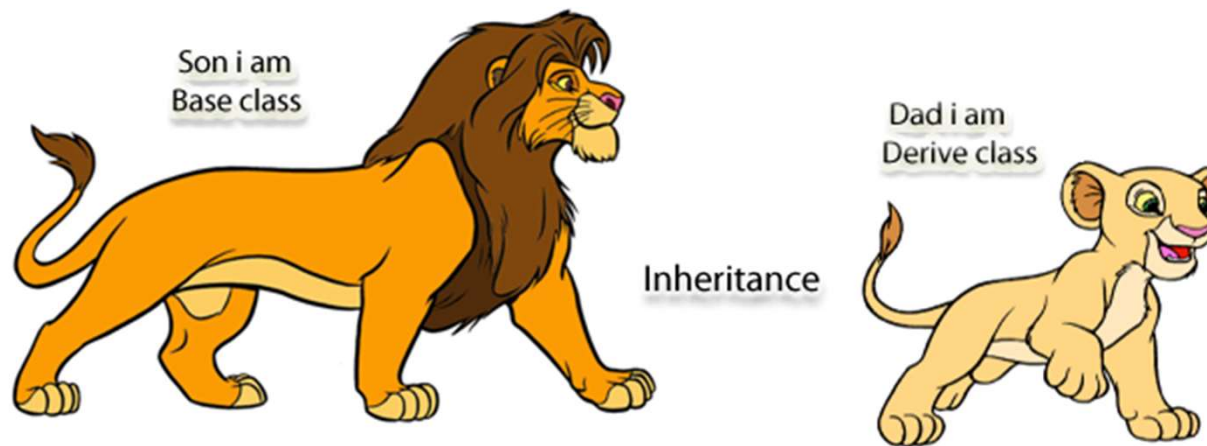
Example:

One example can be to speak something e.g. cat speaks meow, dog barks woof etc.



What is inheritance?

When one object acquires all the properties and behaviours of parent object



What is encapsulation?

It's like wrapping code so only what we want can use it. For example, we don't want that somebody can view the user's password, so we have to encapsulate this attribute.



Classroom example:

Class: Sport Stars



Object: Michael Jordan

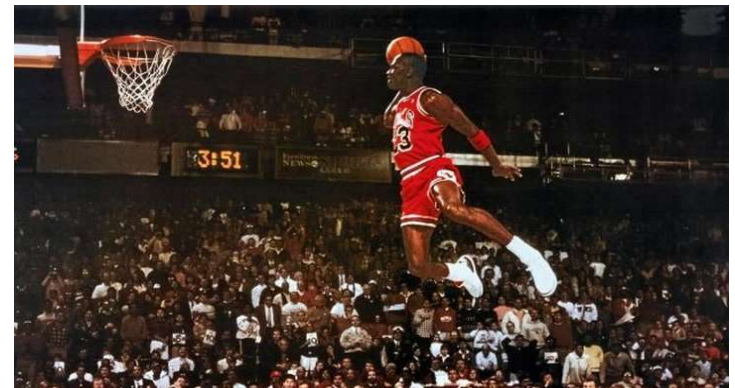
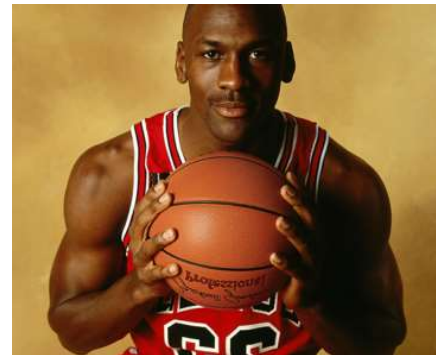


Methods:

Run fast
Jump tall
Make exercise
They appear
on TV

Attributes:

Strong
Agile
Good shape
Wealthy people
Experts in his sport
Famous



What if we pass the list to understand it?

Class



Object

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UNION DE REPUBLICAS SOCIALISTAS SOVIETICAS	
LISTA OFICIAL ALUMNOS DEL GRUPO 2o. "C". 2013-2014	
No.	NOMBRE DEL ALUMNO
1	BARBOSA SANDO DAVO
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Abstraction:

A document to the list.

Polymorphism:

It can contain the points, grades, assistances, or serve other purposes.

Inheritance:

The list will have the same names as the ones in the main database, so, it will inherit these.

Encapsulation:

It will have the name or number of the student, but it is not going to have private fields like the address.

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