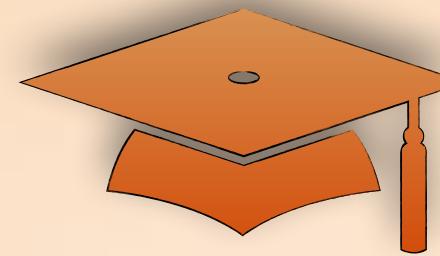


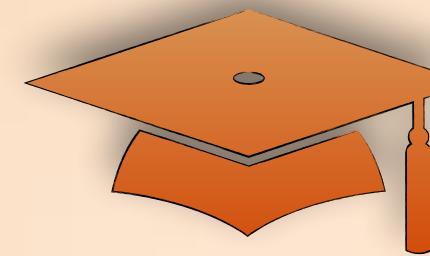
The Complete C# Developer Course



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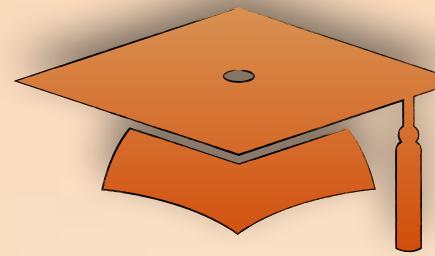
Object-oriented Programming Part 1



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Object-oriented Programming Part 1



What is object-oriented programming?



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What is object-oriented programming?

Object-Oriented Programming (OOP) refers to a type software design where programmers define data type of a data structure, but also the types of operations (functions) that can be applied to the data structure.

In this way the data structure becomes an object that includes both data and functions.

What is object-oriented programming?

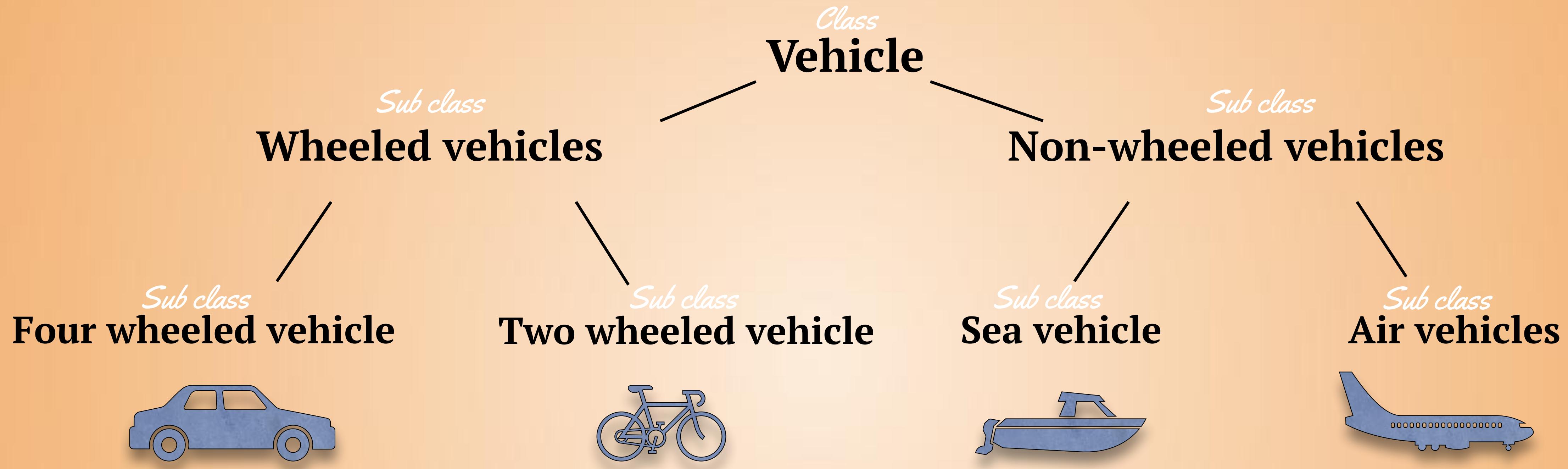
Class : A category of objects. The class defines all the common properties of the different objects that belong to it.

Object : Refers to a particular instance of a class where the object can be a combination of variables, functions, and data structures.

Method : A combination of instructions grouped together to achieve some result. It may take arguments and return result.

Property : A member that provides a flexible mechanism to read, write, or compute the value of a private field

What is object-oriented programming?



Properties

Color, Manufacturer, Max Speed, Carriage Capacity, Gasoline or Electricity

Methods

Start(), Stop(), Drive(), Refuel(), RunAtMaxSpeed(), TransportPeople()

Object

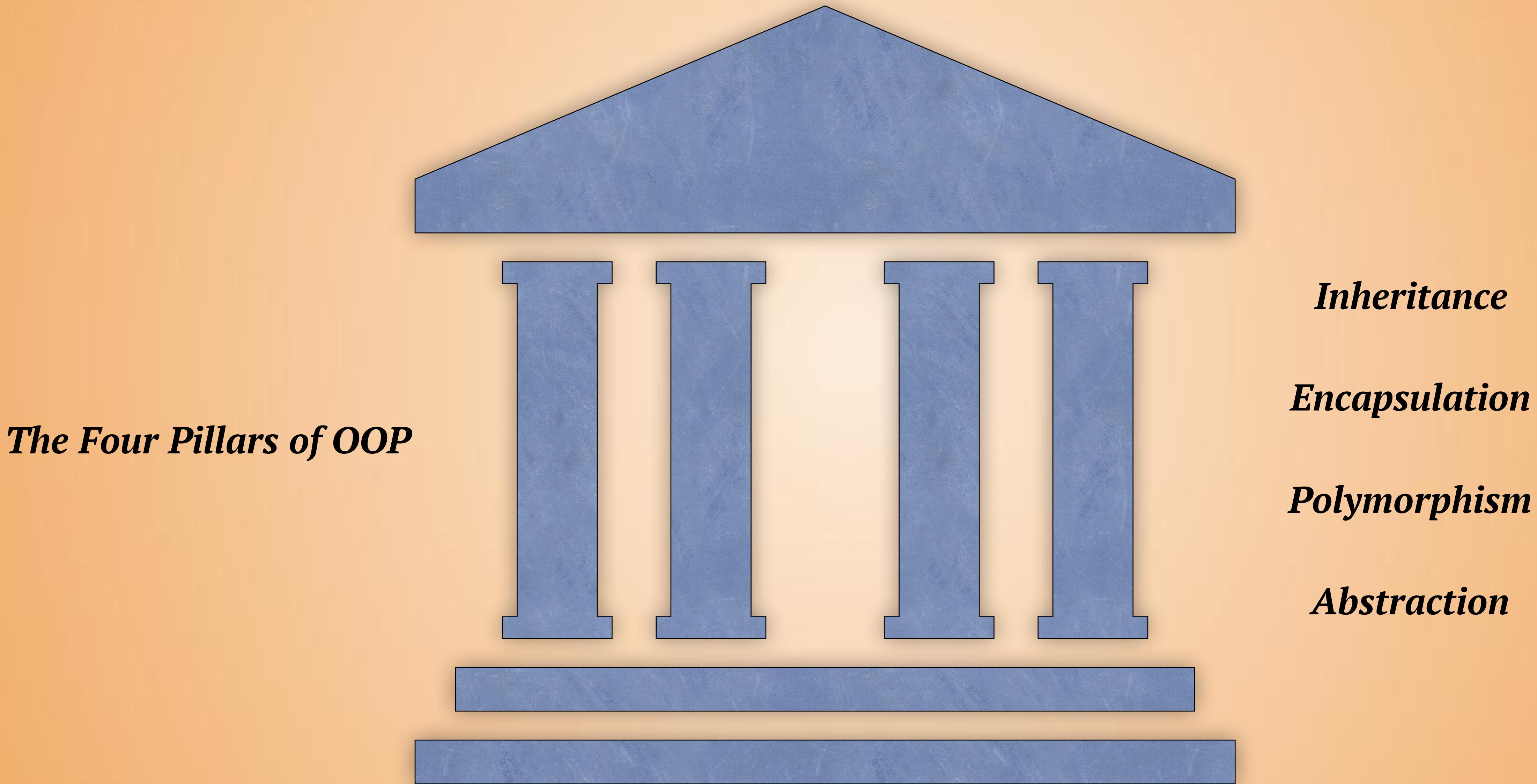
BMW X4

Kawasaki KX450F

Ferrari Enzo

Boeing 787

What is object-oriented programming?



What is object-oriented programming?

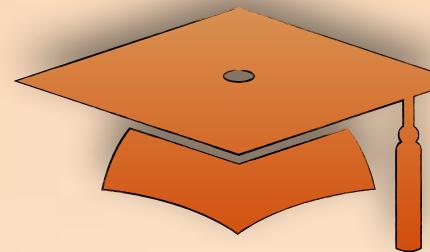
Inheritance : The process of creating the new class by extending the existing class or the process of inheriting the features of base class is called as inheritance.

Encapsulation : Encapsulation is a process of binding data members (variables, properties) and methods together.

Polymorphism : Poly means many and Morph means forms. Polymorphism is the process in which an object or function take different forms.

Abstraction : Abstraction is the process of showing only essential features of an object to the outside world and hide the other irrelevant information.

Object-oriented Programming Part 1



Methods part 1 (The basics)



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Methods part 1 (The basics)

DRY

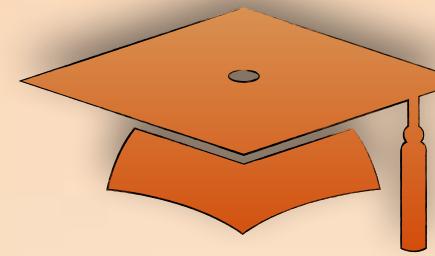
A method is a code block that contains a series of statements. A program causes the statements to be executed by calling the method and specifying any required method arguments.

Methods part 1 (The basics)

Method Signature

Method name and its parameters types (but not the parameter *names*) are part of the signature.

Object-oriented Programming Part 1



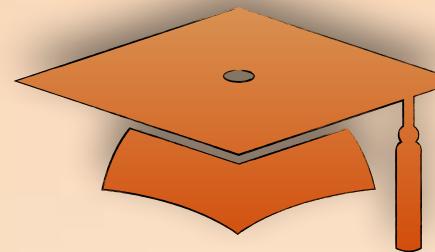
Methods part 2 (parameters and return types)



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Methods part 3 (value vs reference)



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Methods part 3 (value vs reference)

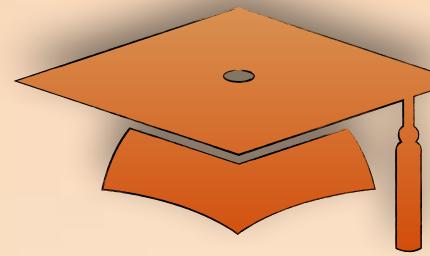
Passing by value (using a copy)

Passing by reference (using the variable itself)

ref keyword

out keyword

Object-oriented Programming Part 1



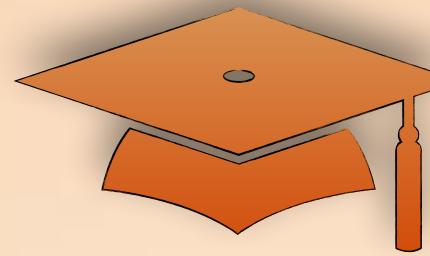
Methods part 4 (overloaded methods)



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Object-oriented Programming Part 1



Overloaded methods exercise



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Overloaded methods exercise

int a,b,c

double x,y,z

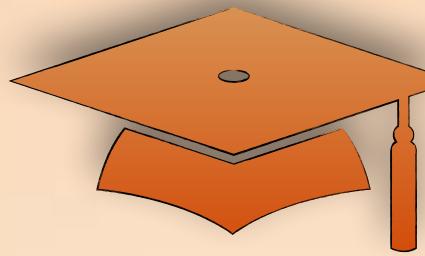
a + b

a + b + c

x + y

x + y + z

Object-oriented Programming Part 1



Classes



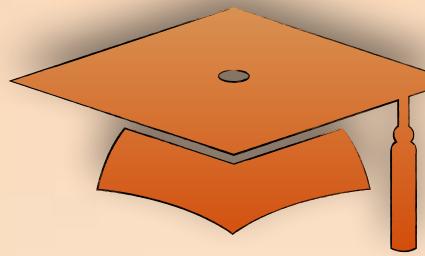
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Classes

template or blueprint of the methods, variables and properties in a particular kind of object

Object-oriented Programming Part 1



Inheritance



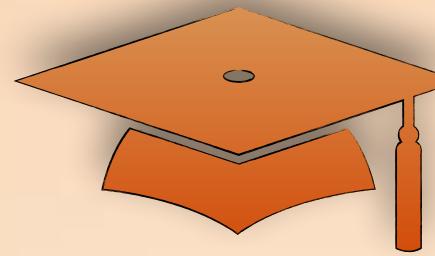
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Inheritance

Inheritance enables new objects to inherit the properties of existing objects. A class that is used as the basis for inheritance is called a superclass or base class. A class that inherits from a superclass is called a subclass or derived class

Object-oriented Programming Part 1



Encapsulation



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Encapsulation

Encapsulation is a concept that binds together the data and methods that manipulate the data, and that keeps both safe from outside interference and misused.

Encapsulation

Access Modifiers

Public: Access is not restricted.

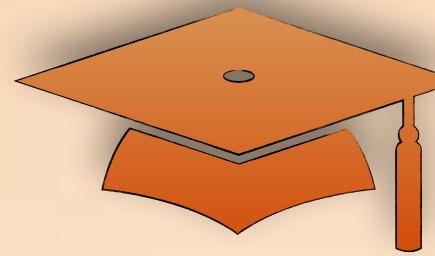
Protected: Access is limited to the containing class or types derived from the containing class.

Private: Access is limited to the containing type.

Internal: Access is limited to the current assembly.

Protected internal: Access is limited to the current assembly or types derived from the containing class.

Object-oriented Programming Part 1



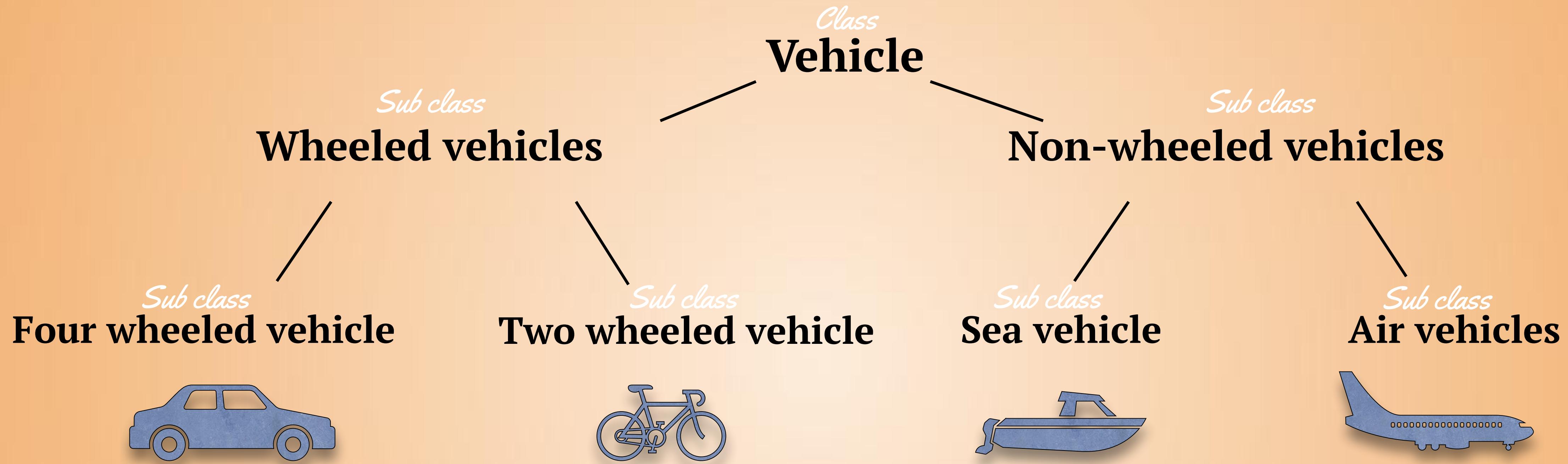
Vehicle inheritance exercise



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Vehicle inheritance exercise



Properties

Color, Manufacturer, Max Speed, Carriage Capacity, Gasoline or Electricity

Methods

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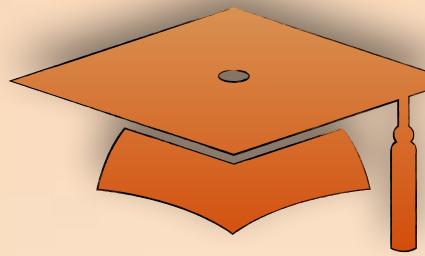
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Polymorphism



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Polymorphism

Polymorphism means having many forms. usually expressed as 'one interface, multiple functions'.

Static type or compile time

Overloading

Dynamic type or runtime

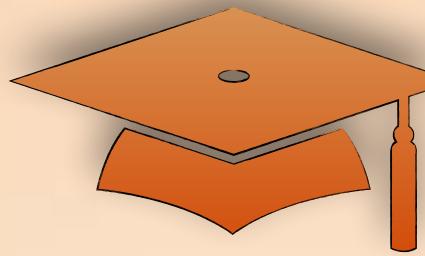
Overriding

Polymorphism

Overriding allows you to change the functionality of a method in a child class.

**virtual
override
new**

Object-oriented Programming Part 1



Abstraction



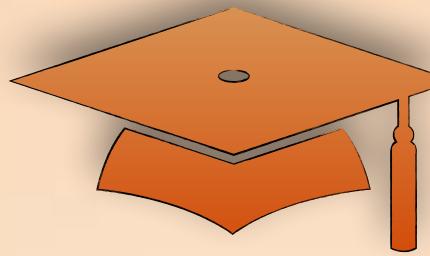
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Abstraction

Abstraction is a concept or an idea not associated with any specific instance.

Object-oriented Programming Part 1



Cars exercise



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Cars exercise

Base class car

Child class Mercedes

Method DisplayInfo()

private decimal price;

public string color;

protected int maxSpeed;

Default values: price is 10000, and color is black and max speed is 300

Overridden values : price is 15000, and color is blue and max speed is 280