# Programming for Everybody

# 9. Classes & Instances

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# Classes and instances

ruby as some built in classes you already know: string, integer, array, hash, etc.

a Ruby *class* is like a “baking pan” from which several ***instances*** can be originated -> because they come from the same “mould”, all of these instances share similar methods and their respective attributes

each instance of a class is a Ruby ***object***

“John” ← this object is an instance of the string class

[1,2,3,4] ← this object is an instance of the array class

12 ← this object is an instance of the integer class

# Building our own classes

we can also create new classes from scratch

class syntax: **class** keyword + **class name** + **end** keyword

within this, we include the **.initialize** method, which "boots up" each object created by the class and which includes its **instance variables** (these set the new objects' specificities)

```
class Car
    def initialize(make, model)
        @make = make
        @model = model
    end
end

Car.new("Honda", "Civic");
```

this class will allows us to create as many *Car* instances as we want

each Car object will have its own make and model

we can create an *instance* of a class just by **calling .new** on the class name and **defining values for the instance variables**

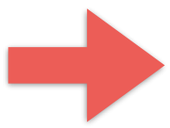
# Class methods

we often define other methods for our classes so that their instances can do interesting stuff

while instance variables define an object's attributes, methods define its ***behaviour***

```
class Person
    def initialize(name)
        @name = name
    end

    def greeting
        puts "Hi!"
    end
end
```



```
mariana = Person.new("Mariana")

mariana.greeting

prints out "Hi!"
```

# Scope

an important aspect of Ruby classes is their *scope* -> the context in which they're available

**global variables** are available everywhere and can be declared in two ways:
- defined outside of any method or class
- preceded by an $ if we want them to become global from inside a method or class (ex: $foo)

**local variables** are only available inside certain methods

# Scope (cont.)

**class variables** belong to a certain class, are preceded by two @s (ex: @@files) and there's only one copy of a class variable which is then shared by all instances of that class

**instance variables** are only available to particular instances of a class and are preceded by an @

global variables can be changed from anywhere in the program and it's better to create variables with limited scope that can only be changed from a few places (ex: instance variables that belong to a particular object)

# Scope (cont.)

The same goes for **methods**

**global methods** are available everywhere

**class methods** are only available to members of a certain class

**instance methods** are only available to particular instances

# Inheritance syntax

**inheritance** is the process by which one class takes on the attributes and methods of another

the derived class (or *subclass*) is the new class we're creating

the base class (or *parent* or *superclass*) is the class from which the derived class inherits

```
inheritance syntax:   class DerivedClass < BaseClass
                        # some stuff
                      end
```

we read "<" as "inherits from"

# Overriding inheritance

sometimes we may want one class that inherits from another to **override** certain methods of their parent

```
class Creature
    def initialize(name)
        @name = name
    end

def skin_color
    puts “Green"
  end

end
```

```
class Dragon < Creature
    def skin_color
        puts “Purple"
    end
end
```

```
bob = Dragon.new("bob")
bob.skin_color

prints out “Purple”
```

class Dragon has inherited its parent’s class instance variables but has overridden its skin_color method

# Inheritance with super

we can directly access the attributes or methods of a parent class with Ruby's built-in **super** keyword

```
class DerivedClass < ParentClass
    def some_method
      super(optional args)
        # Some stuff
      end
    end
end
```

when we call super from inside a method we're telling Ruby to look in the parent class of the current class and find a method with the same name as the one from which super is called

if it finds it, Ruby will use the parent class' version of the method

# Thank you! :)

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