


OOP

~~PURE~~ OBJECT ORIENTED
PROGRAMMING

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- Object oriented programming is not **only** about **classes!!**
 - For instance, in javascript and lua we have prototype based inheritance (no classes)
 - will explain later 

Object oriented programming is about: PASMEN,
objects

Remember objects? That little things that you say that
are **only** instantiated classes?

Well, they are much more

Take the red pill neo

Objects were made to simplify and abstract some concepts like

- state (data)
- ~~complex~~ interactions between and using *state*

One example:

- we have an `Account` object, with a `bankroll` state of 100 dollars
- we also want to have the possibility of `withdrawing` and `depositing` money

```
account = Object.new
# => #<Object:0x00005645237b8810>
account.instance_eval do
  def bankroll
    @bankroll
  end
  def deposit(quantity)
    if @bankroll
      @bankroll += quantity
    else
      @bankroll = quantity
    end
  end
  def withdraw(quantity)
    @bankroll -= quantity
  end
end
```

```
account.bankroll  
# => nil  
account.deposit 12  
# => 12  
account.bankroll  
# => 12  
account.withdraw 4  
# => 4  
account.bankroll  
# => 8
```


- See that we didn't touch about classes, inheritances, methods, properties, polymorphism and all that things?

*And yet, we covered the OOP core, that
is state and interactions regarding
objects*

- With **state** we can relate to **instance properties**
- As for **message passing**, here we can call then **methods**

- we are passing the `deposit` message to the account object
- with the 100 "body"

```
account.deposit 100  
# => 108
```

- we have the bankroll state

```
account.instance_variables  
# => [:@bankroll]  
account.instance_variable_get "@bankroll"  
# => 108
```

But why call then that? Because at least on more pure OOP languages, that is exactly what it means

When we call the objects methods we are *passing a message* to that object, we do **operations on properties to mess with the state**

We don't mess with the state directly!!

```
class Account
  @bankroll
end
# => nil
account = Account.new
# => #<Account:0x000055b5abac0b00>
account.bankroll
# => NoMethodError: undefined method `bankroll' for #<Account:
account.bankroll = 12
# => NoMethodError: undefined method `bankroll=' for #<Account
```

```
class Account
  def bankroll
    @bankroll
  end
  def bankroll=(bankroll)
    @bankroll = bankroll
  end
end
# => :bankroll=
```


- The accessor is a method

```
account = Account.new  
# => #<Account:0x000055b5ab5a9f68>  
account.bankroll  
# => nil
```

- Even the assignment of a instance is a method!!

```
account.bankroll = 12  
# => 12  
account.bankroll  
# => 12
```

- can be like this too

```
account.bankroll= 52  
# => 52  
account.bankroll  
# => 52
```

To a language be *pure* OOP (like smalltalk, and on some points ruby) they have to have some properties like ¹

- **EVERYTHING** is an object
- no primitives like: `int`, `float` (they also are a class)
- objects **ONLY** communicate by message passing
 - that mean no operators
 - no public properties
- ...

- Everything is an object

```
number = 1
# => 1
string = "marcos"
# => "marcos"
number.class
# => Integer
string.class
# => String
```

```
1.class
# => Integer
"marcos".class
# => String
true.class
# => TrueClass
```

- A class is also an object!!! MINDBLOWN

```
class A
end
# => nil

A.is_a? Object
# => true
A.class
# => Class
```

- We only communicate by message passing

```
1.positive?  
# => true  
1.methods.slice(18, 6)  
# => [:=, :=, :=, :=, :=, :=]  
1.== 2  
# => false  
1.size  
# => 8  
1.respond_to? "+"  
# => true
```

- not so pure

```
if.class  
# => SyntaxError: unexpected '.'
```

Questions?

Thanks! 🐱

EXTRAS

1. Prototype based inheritance

