Ruby

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Problem Domain

- Balance Functional and Interpretive Programming Styles
- More Powerful than Perl
- More Object Oriented than Python
- Interpreted Language
    - Supports Many Platforms

Historical Context

- Lead Developer
  - Yukihiro Matsumoto
- Development Period
  - Mid-1990s
- Country of Origin
  - Japan

- Inspiration for Syntax
  - Perl
  - Smalltalk
- Also Influenced by
  - Eiffel
  - Lisp

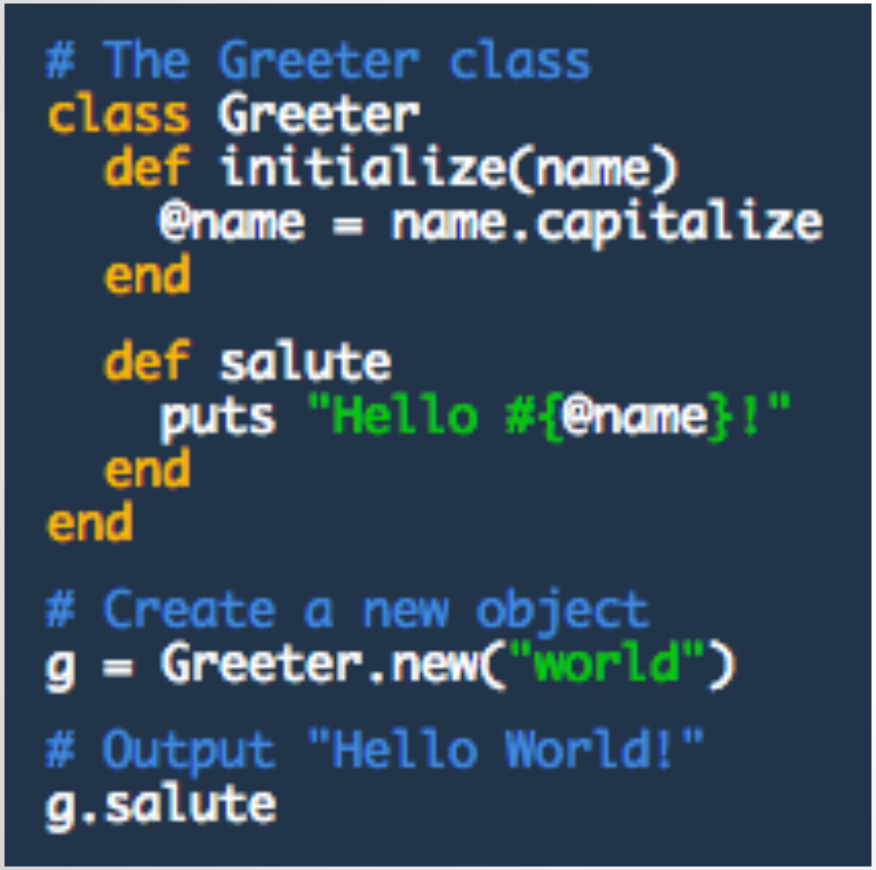
Evolution

- Ruby 1.0 Released (*1996)*
- Ruby on Rails Released (*2005*)
  - Makes Ruby Very Popular
- Branches/Frameworks (*Currently*)
  - Ruby on Rails
    - Web Framework
  - JRuby
    - Integration into Java
  - IronRuby
    - Targeting .Net Framework

Concepts

- Everything is an Object
  - No Primitive Types
- Metaprogramming
  - Program Can Rewrite Itself
- Dynamic Typing
- Everything is *true*, Except *false* and *nil*
- Automatic Garbage Collection
- Centralized Package Management
  - RubyGems

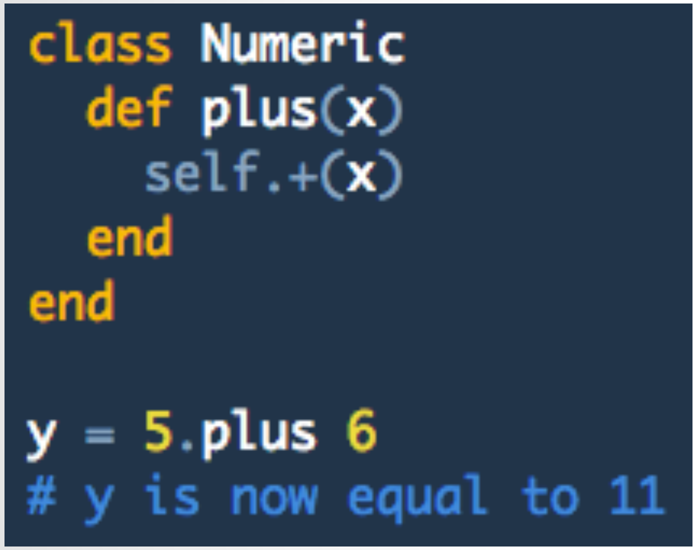
Example 1 - Hello World



```ruby
# The Greeter class
class Greeter
  def initialize(name)
    @name = name.capitalize
  end

  def salute
    puts "Hello #{@name}!"
  end
end

# Create a new object
g = Greeter.new("world")

# Output "Hello World!"
g.salute
```

- `initialize` is used for creating a new object
- Methods begin with `def`
- Class variables prefixed by `@` symbol
- No need to declare type

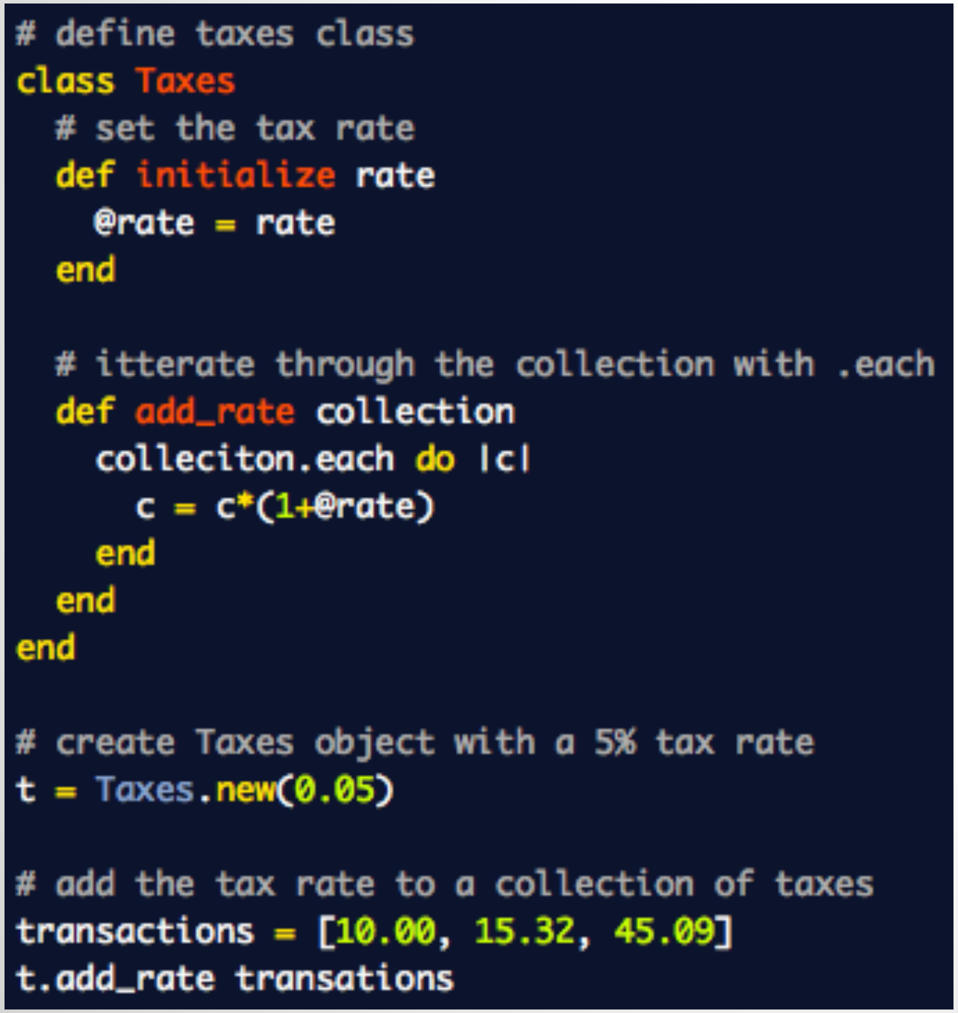
Example 2 - Flexibility



```ruby
class Numeric
  def plus(x)
    self.+(x)
  end
end

y = 5.plus 6
# y is now equal to 11
```

- Add custom method `plus` to built-in `Numeric` class
- Operators can also be overloaded and redefined

Example 3 - Collection Iteration



```
# define taxes class
class Taxes
  # set the tax rate
  def initialize rate
    @rate = rate
  end

  # itterate through the collection with .each
  def add_rate collection
    colleciton.each do |c|
      c = c*(1+@rate)
    end
  end
end

# create Taxes object with a 5% tax rate
t = Taxes.new(0.05)

# add the tax rate to a collection of taxes
transactions = [10.00, 15.32, 45.09]
t.add_rate transations
```

- Iterate over any collection with `.each do |x|`
- Inline array declaration with `[]`

Java Comparison

Ruby	Java
Interpreted	Compiled to Bytecode
Dynamic Typing	Static Typing
Terse Syntax (Automatic Getters and Setters)	Verbose Syntax (Manually Write Getters and Setters)

C++ Comparison

Ruby	**C++**
Interpreted	Compiled
Everything is an Object	Many Primitive Types
Automatic Garbage Collection	Manual Memory Management

Questions?