Inside Ruby:

An In Depth Understanding of Modules

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Outline

Easy

Not So Easy

Best Practices

include & methods

```
module Foo
  def say
    puts "say!"
  end

  def self.cow_say
    puts "moo"
  end
end

class Bar
  include Foo
end

b = Bar.new
b.say # "say!"
Bar.cow_say # NoMethodError
```

instance variables

```
module Foo
  @name # nil
  def say
    puts @name
  end
end

class Bar
  include Foo

  def initialize
    @name = "Lucas"
  end
end

b = Bar.new
b.say # "Lucas"
```

```ruby
module Foo
  def say(word)
    puts word
  end
end

class Bar
  extend Foo
end

b = Bar.say("goodbye") # goodbye
```

Name::Spacing

```
module A
  class B
  end
end

class C
  class D <  A::B
  end
end

A::B.new
C.new
C::D.new
```

```ruby
module Contactable
  def name
    #some code
  end
  module ClassMethods
    def find(name)
      # snip
    end
  end
end

class User
  include Contactable
  extend Contactable::ClassMethods
end

u = User.find("Lucas")
u.name # => "Lucas"
```

```ruby
module Contactable
  def self.included(klass)
    klass.extend(ClassMethods)
  end

  def name
  end

  module ClassMethods
    def find(name)
    end
  end
end

class User
  include Contactable
end

u = User.find("Lucas")
u.name # => "Lucas"
```

```ruby
module Contactable
  attr_accessor :name
  validates_presence_of :name
  #...snip
end

class User < ActiveRecord::Base
  include Contactable
end

# undefined method `validates_presence_of'
```

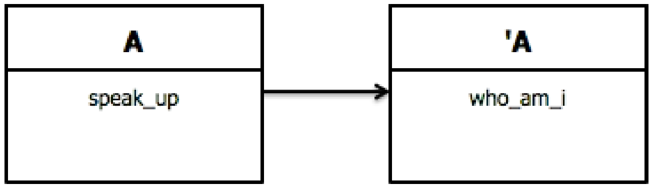
```ruby
module Contactable
  def self.included(klass)
    klass.class_eval do
      attr_accessor :name
      validates_presence_of :name
    end
    #...snip
  end
end

class User
  include Contactable
end

u = User.new
u.valid? # false
u.name = "Lucas"
u.valid? # true
```

Extending Instances

```ruby
class Foo
end

module Bar
  def hello
    "Hello!"
  end
end

f = Foo.new
f.extend(Bar)

f.hello # => "Hello!"
```

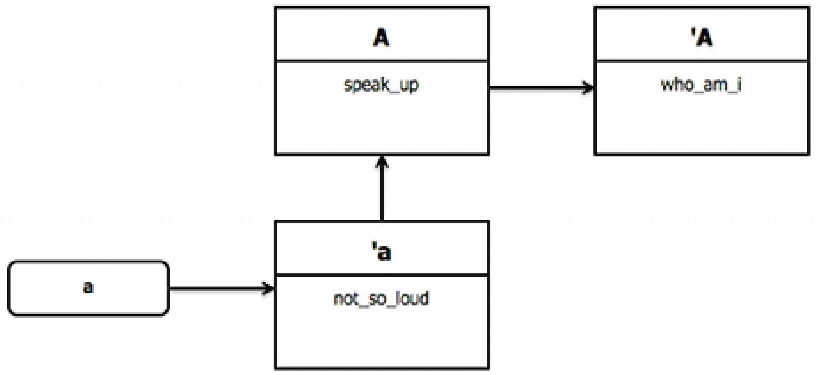
extending your understanding of modules

```
class A
  def self.who_am_i
    puts self
  end

  def speak_up(input)
    puts input.upcase
  end
end
$ A.instance_methods(false) # [:speak_up]
$ A.singleton_methods # => [:who_am_i]
$ A.singleton_class # #<Class:A>
```

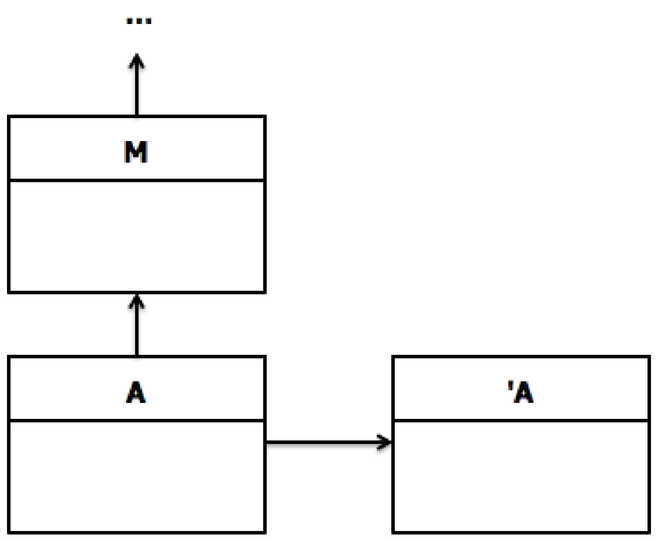


http://ficate.com/explaining-include-and-extend

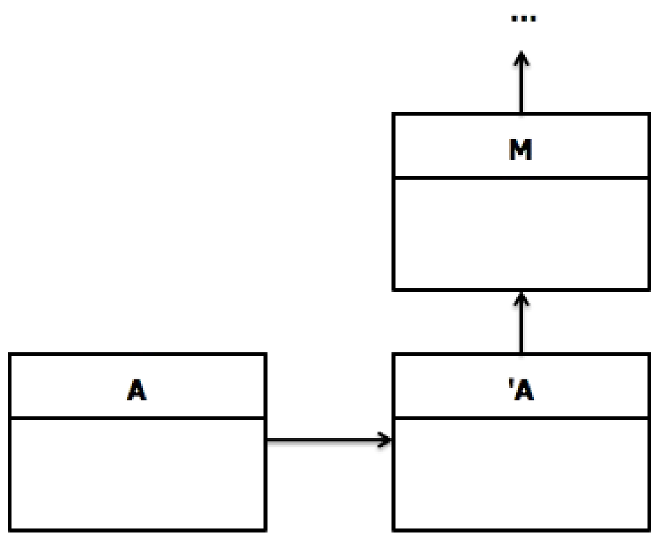
```
a = A.new

def a.not_so_loud(input)
  puts input.downcase
end

a.singleton_methods # [:not_so_loud]
a.singleton_class.superclass # A
```



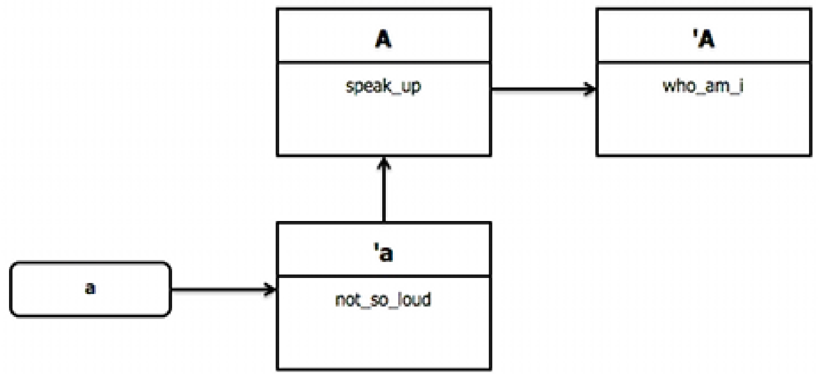
include



extend



```ruby
module Quiet
  def not_so_loud(input)
    puts input.downcase
  end
end

a = A.new
a.extend(Quiet)
```



Method lookup order:

Live Code!

extend self

```
module Beer
  extend self

  def drink
    puts "don't mind if I do."
  end
end
```

self.extend(self)

Beer.extend(Beer)

```
module Beer
  extend self

  def drink
  end
end

module Beer
  def self.drink
  end
end
```

Excuse me, your scope is flat

```
#... inside another class
@data = "Luke"

module BrokenFilter
  def name
    @data
  end
end
self.working_filter = Module.new do
  define_method :name do
    @data
  end
end

class Document
  include Filter.working_filter
end
```

Module Guidelines

Use modules for attributes, use inheritance when the objects are related

Use methods instead of instance variables

Use a thin interface between the class and included module

::END

Thank you!