# Ruby Monstas



Session 11

# **Agenda**

- Recap / Questions
- Classes / Objects and OOP
- Exercises



# Recap

# **Questions**

**Blocks** 

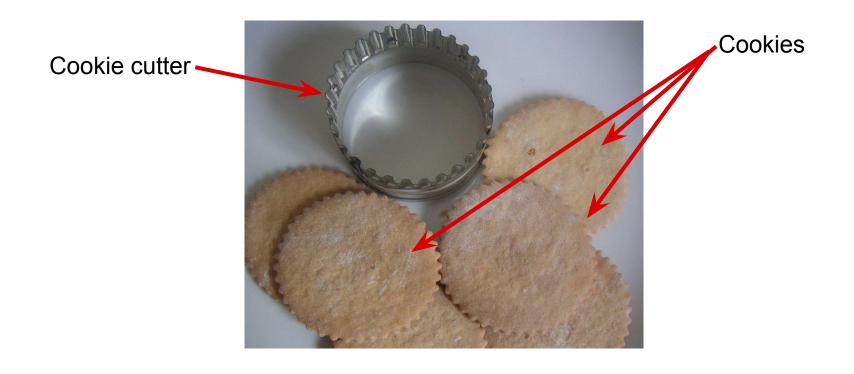
Symbols

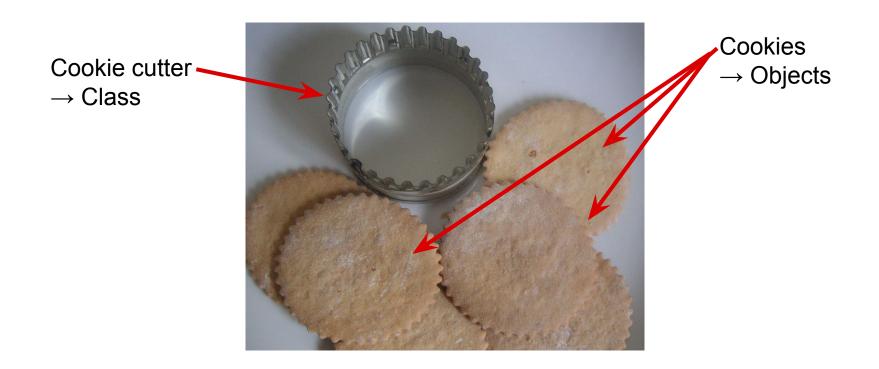
Ranges

# Classes & Objects

Object-oriented programming







The cookie cutter (class) is used to make the dough (memory) into cookies (objects).

### Cat example

The domain of our application: cats!

Therefore it makes sense to have a "Cat" class (cookie cutter).

We can later use our "Cat" class to produce concrete (actual) cats.

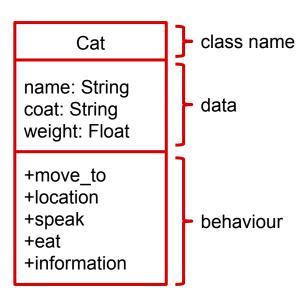
### Cat example: Class diagram

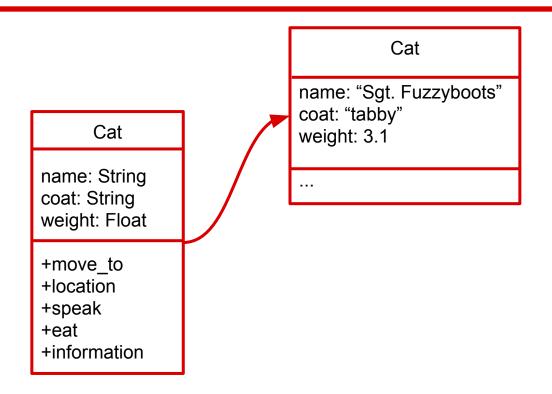
#### Cat

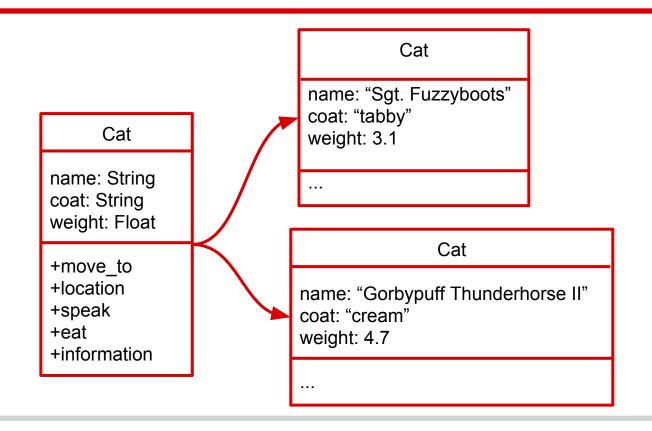
name: String coat: String weight: Float

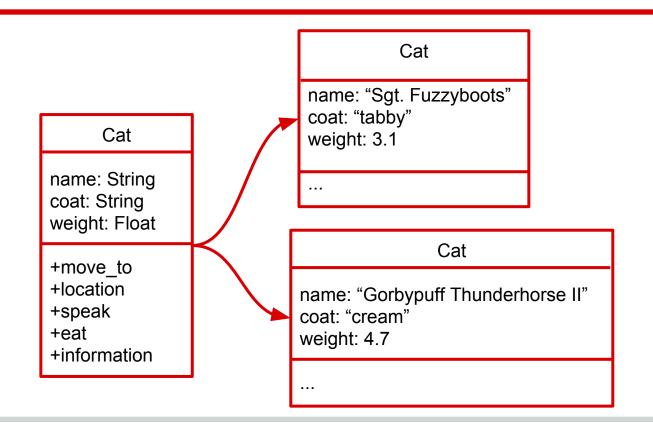
- +move to
- +location
- +speak
- +eat
- +information

# Cat example: Class diagram













#### Cat

name: String coat: String weight: Float



- +location
- +speak
- +eat
- +information

#### Cat

name: "Sgt. Fuzzyboots"

coat: "tabby" weight: 3.1

...





#### Cat

name: "Gorbypuff Thunderhorse II"

coat: "cream" weight: 4.7

. . .





# **Classes in Ruby**

#### Cat

name: String coat: String weight: Float

- +move\_to
- +location
- +speak
- +eat
- +information

### Classes in Ruby: initialize method

#### Cat

name: String coat: String weight: Float

```
+move_to
+location
+speak
+eat
+information
```

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end
```

### Classes in Ruby: initialize method

#### Cat

name: String coat: String weight: Float

+move\_to +location +speak

+eat

+information

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end
```

### Classes in Ruby: initialize method

#### Cat

name: String coat: String weight: Float

+move\_to

+location

+speak

+eat

+information

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end
```

**initialize** is a special method, that allows us to <u>initialize</u> the object we're creating with some data.

The same concept is called "constructor" in other programming languages.

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
   @weight = weight
 end
end
sqt_fuzzyboots = Cat.new(
  'Sgt. Fuzzyboots', 'tabby', 3.1
gorbypuff = Cat.new(
  'Gorbypuff Thunderhorse II',
  'cream',
 4.7
```

#### Cat

name: "Sgt. Fuzzyboots" coat: "tabby"

weight: 3.1

...



#### Cat

name: "Gorbypuff Thunderhorse II"

coat: "cream" weight: 4.7

...



```
class Cat
  def initialize(name, coat, weight)
   @name = name
   @coat = coat
   @weight = weight
 end
end
                        sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
```

1. Cat.new is called, that means initialize gets called in the Cat class.

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end
                        sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
```

2. Local variables name, coat and weight get assigned to the values passed.

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end

sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
```

3. Instance variables @name, @coat and @weight get assigned to the values of the local variables name, coat and weight.

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end

sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
```

4. initialize method is over. Ruby builds an instance (object) of type Cat that contains the data and returns it from the new method call.

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end

sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
```

5. The returned object of type Cat gets assigned to a local variable called sgt\_fuzzyboots outside the class.

```
a = 12
puts a
```

```
a = 12
puts a
```

```
a = 12
    def my_method    def my_method
    a = 12
    puts a    end
    end
    my_method
    my_method
    puts a
```

```
a = 12
             def my_method
                             def my_method
               a = 12
                               a = 12
puts a
               puts a
                             end
             end
                             my_method
             my_method
                             puts a
12
             12
                             NameError
                             (undefined local
                             variable or
                             method `a' for
                             main:Object)
```

```
a = 12
             def my_method
                             def my_method
                                                 def my_method
               a = 12
                               a = 12
                                                   a = 12
puts a
               puts a
                             end
                                                  end
             end
                             my_method
                                                 a = 23
                                                 my_method
             my_method
                             puts a
                                                  puts a
12
             12
                             NameError
                             (undefined local
                             variable or
                             method `a' for
                             main:Object)
```

```
a = 12
             def my_method
                             def my_method
                                                  def my_method
               a = 12
                               a = 12
                                                    a = 12
puts a
               puts a
                             end
                                                  end
             end
                             my_method
                                                  a = 23
                                                  my_method
             my_method
                             puts a
                                                  puts a
12
             12
                             NameError
                                                  23
                             (undefined local
                             variable or
                             method `a' for
                             main:Object)
```

```
a = 12
             def my_method
                             def my_method
                                                  def my_method
               a = 12
                               a = 12
                                                    a = 12
puts a
               puts a
                             end
                                                  end
             end
                             my_method
                                                  a = 23
                                                  my_method
             my_method
                             puts a
                                                  puts a
12
             12
                             NameError
                                                  23
                             (undefined local
                             variable or
                             method `a' for
                             main:Object)
```

```
a = 12
             def my_method
                             def my_method
                                                  def my_method
                                                                      def my_method
               a = 12
                               a = 12
                                                    a = 12
                                                                         a = 12
puts a
               puts a
                             end
                                                  end
                                                                         puts a
             end
                                                                       end
                             my_method
                                                  a = 23
                                                  my_method
                                                                      a = 23
             my_method
                             puts a
                                                                      my_method
                                                  puts a
12
             12
                             NameError
                                                  23
                                                                       12
                              (undefined local
                             variable or
                             method `a' for
                             main:Object)
```

```
class Cat
  def initialize(name, coat, weight)
    @name = name
    @coat = coat
    @weight = weight
  end
end

sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
# do something else
```

```
class MyClass
  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
class MyClass
  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
(nothing (nil))
```

```
class MyClass
  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
class MyClass
  def initialize
    @my_variable = 12
  end

  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
(nothing (nil))
```

```
class MyClass
  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
class MyClass
  def initialize
    @my_variable = 12
  end

  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
(nothing (nil))
```

```
class MyClass
  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
class MyClass
  def initialize
    @my_variable = 12
  end

  def my_method
    @my_variable
  end
end

my_object = MyClass.new
puts my_object.my_method
```

```
class MyClass
  def initialize(my_number)
    @my_variable = my_number
  end

  def my_method
    @my_variable
  end
end

a = MyClass.new(12)
b = MyClass.new(23)

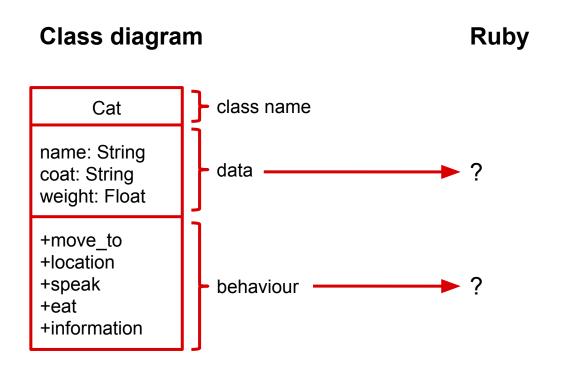
puts b.my_method
puts a.my_method
```

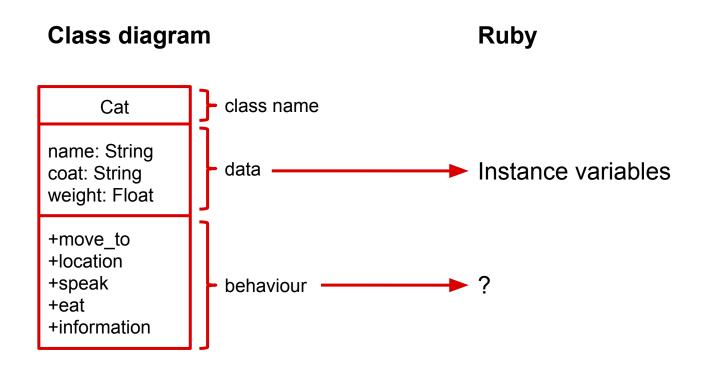
```
(nothing (nil))
```

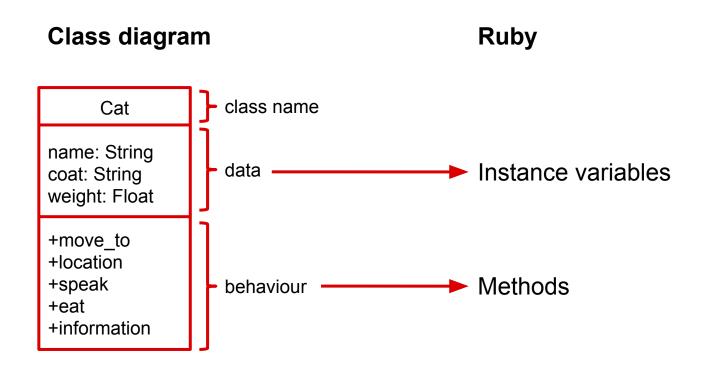
```
class MyClass
  def my_method
   @my_variable
 end
end
my_object = MyClass.new
puts my_object.my_method
(nothing (nil))
```

```
class MyClass
 def initialize
   @my_variable = 12
  end
  def my_method
   @my_variable
  end
end
my_object = MyClass.new
puts my_object.my_method
12
```

```
class MyClass
  def initialize(my_number)
    @my_variable = my_number
  end
  def my_method
    @my_variable
  end
end
a = MyClass.new(12)
b = MyClass.new(23)
puts b.my_method
puts a.my_method
23
12
```







```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
```

```
Meow!
the bed
Sgt. Fuzzyboots has eaten cat food, a treat and is currently here: the
bed
```

sqt\_fuzzyboots = Cat.new('Sqt. Fuzzyboots', 'tabby', 3.1)

sqt\_fuzzyboots.speak

sqt\_fuzzyboots.move\_to('the bed')

```
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information

Meow!
the bed
Sgt. Fuzzyboots has eaten cat food, a treat and is currently here: the bed
```

```
sqt_fuzzyboots = Cat.new('Sqt. Fuzzyboots', 'tabby', 3.1)
sqt_fuzzyboots.speak
sqt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sqt_fuzzyboots.eat('cat food')
sqt_fuzzyboots.eat('a treat')
puts sqt_fuzzyboots.information
Meow!
Sgt. Fuzzyboots has eaten cat food, a treat and is currently here: the
bed
```

sqt\_fuzzyboots = Cat.new('Sqt. Fuzzyboots', 'tabby', 3.1)

sqt\_fuzzyboots.speak

sqt\_fuzzyboots.move\_to('the bed')

```
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information

Meow!
the bed
Sgt. Fuzzyboots has eaten cat food, a treat and is currently here: the bed
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
# ...
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def speak
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def speak
   puts 'Meow!'
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
# ...
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def move_to(location)
   # ...
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def move_to(location)
    @location = location
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def move_to(location)
    @location = location
  end
  def location
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def move_to(location)
    @location = location
  end
  def location
    @location
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
# ...
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def eat(food)
   # ...
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
 # ...
  def eat(food)
    @foods << food</pre>
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
  def initialize(name, coat, weight)
   # ...
  end
  def eat(food)
   @foods << food
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
class Cat
  def initialize(name, coat, weight)
   # ...
   @foods = []
  end
  def eat(food)
   @foods << food
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
```

Sgt. Fuzzyboots has eaten cat food, a treat and is currently here: the bed

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information

Sgt. Fuzzyboots has eaten
cat food, a treat and is
class Cat
# ...
end
class Cat
# ...
end
```

end

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information

Sgt. Fuzzyboots has eaten
cat food, a treat and is
currently here: the bed

# ...
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
                                                        Sgt. Fuzzyboots has eaten
                                                        cat food, a treat and is
                                                        currently here: the bed
class Cat
 # . . .
 def information
   # ...
  end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
                                                        Sgt. Fuzzyboots has eaten
                                                        cat food, a treat and is
                                                        currently here: the bed
class Cat
  def information
    "#{@name} has eaten"
 end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
                                                     🛌 Sgt. Fuzzyboots has eaten
                                                        cat food, a treat and is
                                                        currently here: the bed
class Cat
  def information
    "#{@name} has eaten"
 end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
                                                      🛌 Sgt. Fuzzyboots has eaten
                                                         cat food, a treat and is
                                                         currently here: the bed
class Cat
 # . . .
  def information
    "#{@name} has eaten #{@foods.join(', ')}"
 end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
                                                     🛌 Sgt. Fuzzyboots has eaten
                                                        cat food, a treat and is
                                                        currently here: the bed
class Cat
  def information
    "#{@name} has eaten #{@foods.join(', ')}"
 end
end
```

```
sgt_fuzzyboots = Cat.new('Sgt. Fuzzyboots', 'tabby', 3.1)
sgt_fuzzyboots.speak
sgt_fuzzyboots.move_to('the bed')
puts sgt_fuzzyboots.location
sgt_fuzzyboots.eat('cat food')
sgt_fuzzyboots.eat('a treat')
puts sgt_fuzzyboots.information
                                                      🛌 Sgt. Fuzzyboots has eaten
                                                         cat food, a treat and is
                                                         currently here: the bed
class Cat
 # . . .
  def information
    "#{@name} has eaten #{@foods.join(', ')} and is currently here: #{location}"
 end
end
```

# Time to practice



Let's get to it!