Let’s put what we learned about code reuse all together.  
  
First, let’s look back at **inheritance**. Run the following cell that defines a generic Animal class.

In [1]:



**class** Animal:

name **=** ""

category **=** ""

**def** \_\_init\_\_(self, name):

self.name **=** name

**def** set\_category(self, category):

self.category **=** category

What we have is not enough to do much -- yet. That’s where you come in.  
  
In the next cell, define a Turtle class that inherits from the Animal class. Then go ahead and set its category. For instance, a turtle is generally considered a reptile. Although modern cladistics call this categorization into question, for purposes of this exercise we will say turtles are reptiles!

In [2]:



**class** Turtle(Animal):

category **=** "reptile"

Run the following cell to check whether you correctly defined your Turtle class and set its category to reptile.

In [4]:



print(Turtle.category)

reptile

Was the output of the above cell reptile? If not, go back and edit your Turtle class making sure that it inherits from the Animal class and its category is properly set to reptile. Be sure to re-run that cell once you've finished your edits. Did you get it? If so, great!

Next, let’s practice **composition** a little bit. This one will require a second type of Animal that is in the same category as the first. For example, since you already created a Turtle class, go ahead and create a Snake class. Don’t forget that it also inherits from the Animal class and that its category should be set to reptile.

In [3]:



**class** Snake(Animal):

category **=** "reptile"

Now, let’s say we have a large variety of Animals (such as turtles and snakes) in a Zoo. Below we have the Zoo class. We’re going to use it to organize our various Animals. Remember, inheritance says a Turtle is an Animal, but a Zoo is not an Animal and an Animal is not a Zoo -- though they are related to one another.

Fill in the blanks of the Zoo class below so that you can use **zoo.add\_animal( )** to add instances of the Animal subclasses you created above. Once you’ve added them all, you should be able to use **zoo.total\_of\_category( )** to tell you exactly how many individual Animal types the Zoo has for each category! Be sure to run the cell once you've finished your edits.

In [5]:



**class** Zoo:

**def** \_\_init\_\_(self):

self.current\_animals **=** {}

**def** add\_animal(self, animal):

self.current\_animals[animal.name] **=** animal.category

**def** total\_of\_category(self, category):

result **=** 0

**for** animal **in** self.current\_animals.values():

**if** animal **==** category:

result **+=** 1

**return** result

​

zoo **=** Zoo()

Run the following cell to check whether you properly filled in the blanks of your Zoo class.

In [6]:



turtle **=** Turtle("Turtle") *#create an instance of the Turtle class*

snake **=** Snake("Snake") *#create an instance of the Snake class*

​

zoo.add\_animal(turtle)

zoo.add\_animal(snake)

​

print(zoo.total\_of\_category("reptile")) *#how many zoo animal types in the reptile category*

2

Was the output of the above cell 2? If not, go back and edit the Zoo class making sure to fill in the blanks with the appropriate attributes. Be sure to re-run that cell once you've finished your edits.  
  
Did you get it? If so, perfect! You have successfully defined your Turtle and Snake subclasses as well as your Zoo class. You are all done with this notebook. Great work!