

# Classes Exercises

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## The “Person” Class

- Modeling a person is a classic exercise for people who are trying to learn how to write classes. We are all familiar with characteristics and behaviors of people, so it is a good exercise to try.
  - Define a *Person(object)* class.
  - In the *\_\_init\_\_(self)* function, define several attributes of a person. Good attributes to consider are name, age, place of birth, and anything else you like to know about the people in your life.
  - Write one method. This could be as simple as *introduce\_yourself(self)*. This method would print out a statement such as: "Hello, my name is Eric."
  - Create a Person, set the attribute values appropriately, and print out information about the person.
  - Call your method on the person you created. Make sure your method executed properly; if the method does not print anything out directly, print something before and after calling the method to make sure it did what it was supposed to.

## The “Sample” Class

- Modeling a sample is another classic exercise.
  - Define a *Sample(object)* class.
  - In the *\_\_init\_\_(self)* function, define several attributes of a sample. Some good attributes to consider are geographic coordinates (x,y, year), sample collector, or any other aspect of a sample you care to include in your class.
  - Write one method. This could be something such as *describe\_sample(self)*. This method could print a series of statements that describe the sample, using the information that is stored in the attributes. Try to be creative.
  - Create a Sample object, and use your method.
  - Create several Sample objects with different values for the attributes. Use your method on several of your Sample.
  - Use the file *class\_glossary.pdf* and try to associate the following words with pieces of your code related to the sample class: *Class*, *Attribute*, *Method*, *Instance*, *Instantiation*.
  - Create a *Child* class that inherits from the class *Sample*, it could be a *SkinSample*, a *SoilSample* or a *MoonSample* for example. Also make an *instance* of that class.
  - Make sure that your code then contains method that *overrides* a parent method.

## Python in style exercise

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Rewrite the script presented in the file *pythoninstyle\_exerciseA.py*. Try to avoid redundancy. Focus on structure, functions, names of variable and on commenting your code.

Once you have written a clean code that returns the same thing than yesterday, try adding one option to your script that could be of use to the biologist that is looking for a pattern in the DNA sequence.

## Plotting Exercise

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There are many more possibilities using *pyplot* and *pandas*. If you have time left, combine the knowledge you got these last three days to read some of your own data into python using *pandas* and make it into a python plot. If you want some inspiration, look at the pyplot library which contain dozens of plots and their associated code.

<http://matplotlib.org/gallery.html>

## Optional exercise

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Consider spending some time to learn more about the details of *pandas* doing the remaining tutorials.