**CIS 133Y: Python Programming I**

# Lab 6 - Classes and Objects

**Lab 6 is an individual programming assignment - you must complete it on your own.**

## **Purpose**

For Lab 6, you will write a simple Object Oriented program that includes a class for fetching a list of objects and a class to hold the data fetched. Then, write a simple main function that fetches the data, loops through the objects, and displays the data to the console. In Lab 7, you will add a connection to a database to retrieve the data.

**After completing this assignment, you will be able to:**

* Write simple programs that use N-tier Architecture with separate modules for a data layer, a business logic layer, and a presentation or UI layer
* Create a data class to hold records of information
* Use name mangling to implement data hiding encapsulation
* Provide setters and getters for private properties
* Implement static methods and class methods

## **Task**

The below instructions cover creating a program that uses Name data from the US Census Bureau. Next week, we'll be reading this data out of a live database for Lab 7. You are free to use a different type of data if you wish, as long as there are at least four properties for each object, and at least five objects. However, be aware that this might cause difficulties next week unless the data you are using is already in a database.

Your program must include the following requirements:

* Your program should consist of three files: **main.py**, **Name.py** (or whatever is appropriate to hold the data you're using if you decide not to use Name data), and **Database.py**.
* **Name.py** should include a class definition for a **Name** class. Each **Name** object should include properties for the name (a piece of text such as "John"), the year (a number such as 1915), a gender (the text "M" or "F"), and the count (a number such as 47577 which represents the number of babies that were born in 1915 who were given the name John and registered with the Census Bureau as Male). Disclaimer: I do not endorse the Census Bureau's decision to restrict the values in the gender column to "M" or "F", but that's all the data they have released to the public.
* The **Name** class should use name mangling (see Module 6 Lesson 3) to protect the values of the properties. Include a constructor that takes values for name, year, gender, and count and setters and getters for each property.
* The **Database.py** file should just be "stubbed" in this lab since you will learn how to fetch data from a database next week. For this lab, you only need to define a class named **Database** with a single class method (see Module 6 Lesson 6) named **readNames()**. When **readNames()** is called, it should return a list containing at least 4 **dictionary objects with name data**. Any values are fine at this point.  
    
  **Example Dictionary Object**:  
  {“name”:”bob”,”gender”:”M”,”year”:1907,”count”:38737}  
    
   If you're not sure what values to return, you can use this data:

|  | **Name** | **Year** | **Gender** | **Count** |
| --- | --- | --- | --- | --- |
| 1 | John | 1915 | M | 47577 |
| 2 | John | 1916 | M | 50046 |
| 3 | John | 1917 | M | 51851 |
| 4 | John | 1918 | M | 56559 |
| 5 | John | 1919 | M | 53532 |

* The **Name** class should have a static method (see Module 6 Lesson 6) called **readNames()** which calls **Database.readNames()** and returns its results.
* **main.py** should include a main function which calls **Name.readNames()**. The **readNames()** method should return a list of **Name** objects. Your main function should loop through each **Name** object in the list of **Name** objects and write a line to the console that includes all of the data for that **Name** object. Your output should look something like this (fancier is fine, but not required, and you are free to use different data):

1915 John M 47577  
1916 John M 50046  
1917 John M 51851  
1918 John M 56559  
1919 John M 53532

## **Criteria for Success**

* Please open and compare your work with the [grading rubric](https://docs.google.com/document/d/1vjkyMxEs1zqorR7GatK_9oVah8BPL6N7LXQmcKE-564/edit?usp=sharing) before submitting.
* Remember to follow all [Python Style Guide](https://docs.google.com/document/d/14U956Z4Q0D52ULxrqeJngaqFb7GWxLFAE_kQsHSMZos/edit?usp=sharing) rules for CIS 133Y.
* Include the required [comment header](https://docs.google.com/document/d/14U956Z4Q0D52ULxrqeJngaqFb7GWxLFAE_kQsHSMZos/edit#heading=h.rzlvsh2gsndw) at the top of your code and Include your name, lab number, a brief description of the program, a list of all input accepted from the user, a list of all variables used as output in print() statements, and any sources you used.
* Programs without comments will not be graded - you will be asked to resubmit with comments for grading.
* When you have completed the project and verified that it works correctly, zip up your project folder, including main.py, Name.py, and Database.py, upload it to the Lab 6 assignment folder, and answer the submission question posted on the assignment in D2L.

## **Academic Integrity**

As a reminder, learning to code can be difficult and frustrating and takes LOTS of practice. Our academic integrity policy for this course states that when completing programming assignments you may:

* review course materials
* look things up in the Python documentation
* google specific questions online, such as "syntax for Python while loops"
* use the sample program as a starting idea only - you must start with a blank algorithmic design planning document and Python file

You may NOT, under any circumstances, begin a programming assignment by:

* looking for completed code which you can then modify
* starting with a copy of the actual sample program and modify
* asking a more experienced friend or family member to outline a solution for you

The only way to learn to code is to do it yourself. The assignments will build from examples during the D2L lessons, so ask for clarification on the **Ask Questions!** discussion topic if something seems confusing. If you start with code from another source and change the variable names or other content to make it look original, you will receive a zero on the assignment.

I may ask you to explain your assignment verbally. If you cannot satisfactorily explain what your code does, and answer questions about why you wrote it in a particular way, then you should also expect a zero.