**Python Directions**: Create a Python module on your Z:\GameDev folder named oop\_ex2.py. Add the following code to the module. Do not forget to test!!!

***Java Directions****: If you are doing this as a Java exercise, you will need to create a class file for each class and test it in a main method. Sample Java main method follows:*

*Public static void main(String[] args) {*

*}*

**Constructor method –** A special method called when an object instance is created. Constructors accept parameters and typically are used to set instance variables with default values. Constructors are used to do anything that needs to be done when an Object is created.

**Getters and Setters** – Methods that allow instances of other objects to access (getters) or store (setters) values of object variables.

**Rectangle Class**

1. Define a class named Rectangle. This class should have two attributes and one method:
   1. Attributes
      1. length
      2. width
   2. Method
      1. area(), A method that calculates and **returns** the calculated area of the rectangle *(look it up if you do not know)*
      2. This method has no parameters, because it uses the length and width instance variables.
2. Create a constructor for the Rectangle class. This constructor needs to receive length and width parameters.
3. Create an instance of the Rectangle class.
4. Create an instance of the Rectangle class passing a value for radius.
5. Call the area() method and print the results returned.

**Student Class**

1. Define a class named Student. This class should have three attributes and six methods:
   1. Attributes
      1. studentID
      2. gradYear
      3. gender
   2. Methods ***(Python coders: DO NOT USE THE input() function for these methods)***
      1. studentId (), A method that changes the studentId based upon the value passed into the method.
      2. setGradYear(), A method that changes the gradYear based upon the value passed into the method.
      3. setGender(), A method that changes the gender based upon the value passed into the method.
      4. Three methods, one for each attribute that returns the value.
         1. getStudentId() getGradYear() getGender()
2. Create a constructor method in the Student class. Code this method to accept parameter values for the three attributes (studentId, gradYear, and gender). Set the properties based upon the parameters passed into the constructor method.

**Note**: *These properties are called* ***instance variables****. Each instance of the class will have its own set of these variables. Instance variables are typically defined just below the class definition statement. They should be passed in to the constructor which then sets the values of the instance variables.*

**Java Programmers must include a modifier when defining these variables that forces other routines to use the setters and getters.** *Unfortunately this cannot be done in Python.*

1. Create an instance of the Student class passing values for the three parameters (studentId, gradYear, gender).
2. Print the attributes of the Student object using the getStudentId(), getGradYear(),and getGender() methods.
3. Set the attributes of the Student object using the setStudentId(), setGradYear(),and, setGender() methods.
4. Again, print the attributes of the Student object using the getStudentId(), getGradYear(),and getGender() methods.