# **Assignment 19**

#### 1. Make a class called Thing with no contents and print it. Then, create an object called example from this class and also print it. Are the printed values the same or different?

In [1]:

**class** Thing:  
 **pass**  
  
**print(Thing)**  
  
**example =** Thing()  
print(example)

<\_\_main\_\_.Thing object at 0x0000019773483280>

#### 2. Create a new class called Thing2 and add the value 'abc' to the letters class attribute. Letters should be printed.

In [2]:

**class** Thing2:  
 letters **=** 'abc'  
   
print(Thing2**.**letters)

abc

#### 3. Make yet another class called, of course, Thing3. This time, assign the value 'xyz' to an instance (object) attribute called letters. Print letters. Do you need to make an object from the class to do this?

In [3]:

**class** Thing3:   
 **def** \_\_init\_\_(self):  
 self**.**letters **=** 'xyz'  
   
try:   
 print(Thing3**.**letters) *# Will raise a syntax Error*  
*except*:  
 my\_thing **=** Thing3()  
 print(my\_thing**.**letters)

xyz

#### 4. Create an Element class with the instance attributes name, symbol, and number. Create a class object with the values 'Hydrogen,' 'H,' and 1.

In [4]:

**class** Element:   
 **def** \_\_init\_\_(self, name, symbol, number):  
 self**.**name **=** name  
 self**.**symbol **=** symbol  
 self**.**number **=** number  
  
my\_elements **=** Element('Hydrogen','H',1)

#### 5. Make a dictionary with these keys and values: 'name': 'Hydrogen', 'symbol': 'H', 'number': 1. Then, create an object called hydrogen from class Element using this dictionary.

In [5]:

custom\_dict **=** {'name':'Hydrogen','symbol':'H','number':1}  
print(custom\_dict)  
  
# Method 1  
hydrogen **=** Element(**\***custom\_dict**.**values())  
print('Using Method #1 ->',hydrogen**.**name,hydrogen**.**symbol,hydrogen**.**number, sep**=**'\t')  
  
# Method 2  
hydrogen **=** Element(**\*\***custom\_dict)  
print('Using Method #2 ->',hydrogen**.**name,hydrogen**.**symbol,hydrogen**.**number, sep**=**'\t')

{'name': 'Hydrogen', 'symbol': 'H', 'number': 1}  
Using Method #1 -> Hydrogen H 1  
Using Method #2 -> Hydrogen H 1

#### 6. For the Element class, define a method called dump() that prints the values of the object’s attributes (name, symbol, and number). Create the hydrogen object from this new definition and use dump() to print its attributes.

In [6]:

**class** Element:  
 **def** \_\_init\_\_(self, name, symbol, number):  
 self**.**name **=** name  
 self**.**symbol **=** symbol  
 self**.**number **=** number   
 **def** dump(self):  
 print(self**.**name, self**.**symbol, self**.**number)  
   
hydrogen **=** Element('Hydrogen','H',1)  
hydrogen**.**dump()

Hydrogen H 1

#### 7. Call print(hydrogen). In the definition of Element, change the name of method dump to \_\_str\_\_, create a new hydrogen object, and call print(hydrogen) again.

In [7]:

print(hydrogen)  
  
class Element:  
 **def** \_\_init\_\_(self, name, symbol, number):  
 self**.**name **=** name  
 self**.**symbol **=** symbol  
 self**.**number **=** number   
 **def** \_\_str\_\_(self):  
 **return** f'{self**.**name} {self**.**symbol} {self**.**number}'  
   
Hydrogen **=** Element('Hydrogen','H',1)  
print(Hydrogen)

<\_\_main\_\_.Element object at 0x00000197734BC280>  
Hydrogen H 1

#### 8. Modify Element to make the attributes name, symbol, and number private. Define a getter property for each to return its value.

In [8]:

**class** Element:  
 **def** \_\_init\_\_(self,name,symbol,number):  
 self**.**\_\_name **=** name  
 self**.**\_\_symbol **=** symbol  
 self**.**\_\_number **=** number  
   
 @property  
 **def** get\_name(self):  
 **return** self**.**\_\_name  
   
 @property  
 **def** get\_symbol(self):  
 **return** self**.**\_\_symbol  
   
 @property  
 **def** get\_number(self):  
 **return** self**.**\_\_number  
   
hydrogen **=** Element('Hydrogen','H',1)  
print(hydrogen**.**get\_name)  
print(hydrogen**.**get\_symbol)  
print(hydrogen**.**get\_number)

Hydrogen  
H  
1

#### 9. Define three classes: Bear, Rabbit, and Octothorpe. For each, define only one method: eats(). This should return 'berries' (Bear), 'clover' (Rabbit), or 'campers' (Octothorpe). Create one object from each and print what it eats.

In [9]:

**class** Bear:  
 **def** eats(self):  
 print('berries')  
class Rabbit:  
 **def** eats(self):  
 print('clover')  
class Octothorpe:  
 **def** eats(self):  
 print('campers')  
   
bear **=** Bear()  
rabbit **=** Rabbit()  
octothrope **=** Octothorpe()  
  
bear**.**eats()  
rabbit**.**eats()  
octothrope**.**eats()

berries  
clover  
campers

#### 10. Define these classes: Laser, Claw, and SmartPhone. Each has only one method: does(). This returns 'disintegrate' (Laser), 'crush' (Claw), or 'ring' (SmartPhone). Then, define the class Robot that has one instance (object) of each of these. Define a does() method for the Robot that prints what its component objects do.

In [10]:

**class** Laser:  
 **def** does(self):  
 **return** 'disintegrate'  
class Claw:  
 **def** does(self):  
 **return** 'crush'  
class Smartphone:  
 **def** does(self):  
 **return** 'ring'  
class Robot:  
 **def** \_\_init\_\_(self):  
 self**.**laser **=** Laser()  
 self**.**claw **=** Claw()  
 self**.**smartphone **=** Smartphone()  
 **def** does(self):  
 print(self**.**laser**.**does(),self**.**claw**.**does(),self**.**smartphone**.**does())  
   
r2d2 **=** Robot()  
r2d2**.**does()

disintegrate crush ring