

Assignment 19 Solutions

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)

<class '__main__.Thing'>
<__main__.Thing object at 0x00000173490B1970>
```

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 [8]: class Thing3:
        def __init__(self):
            self.letters = 'xyz'

        try:
            print(Thing3.letters)
        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 [9]: 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 [10]: 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 [11]: 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 [12]: 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 0x00000173490A2040>
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 [16]: 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 [17]:

```
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 [18]:

```
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
```