

Some readings:

https://www.tutorialspoint.com/python/python_classes_objects.htm

<https://github.com/chenmingxue/Python-Learn-Practice-SmallProjects>

<https://www.pythonprogramming.in/object-oriented-programming.html>

Example question with answer:

- A. Write a Rectangle class in Python language, allowing you to build a rectangle with length and width attributes.
- B. Create a Perimeter() method to calculate the perimeter of the rectangle and a Area() method to calculate the area of the rectangle.
- C. Create a method display() that display the length, width, perimeter and area of an object created using an instantiation on rectangle class.
- D. Create a Cuboid child class inheriting from the Rectangle class and with a height attribute and another Volume() method to calculate the volume of the Cuboid.

```
class Rectangle:
    # define constructor with attributes: length and width
    def __init__(self, length , width):
        self.length = length
        self.width = width

    # getter method
    def get_length(self):
        return self._length

    # setter method
    def set_length(self, x):
        self._length = x

    # Create Perimeter method
    def Perimeter(self):
        return 2*(self.length + self.width)

    # Create area method
    def Area(self):
        return self.length*self.width

    # create display method
    def display(self):
        print("The length of rectangle is: ", self.length)
        print("The width of rectangle is: ", self.width)
        print("The perimeter of rectangle is: ", self.Perimeter())
        print("The area of rectangle is: ", self.Area())
```

```
class Cuboid(Rectangle):
    def __init__(self, length, width , height):
        Rectangle.__init__(self, length, width)
        self.height = height

    # define Volume method
    def volume(self):
        return self.length*self.width*self.height

    # define Surface area method #polymorphism
    def Area(self):
        SA = 2*((self.length*self.width)+(self.height*self.width)+
(*self.length*self.height))
        return SA
```

```
myRectangle = Rectangle(7 , 5) #create Rectangle object
myRectangle.display() #calling the method on the object
print("-----")
myCuboid = Cuboid(7 , 5 , 2) #create a Cuboid object
print("the volume of myCuboid is: " , myCuboid.volume())
```

Feel free to add additional functionalities like Square, Cube, etc.

Question 1

- A. Define a Book class with the following attributes: Title, Author (Full name), Price.
- B. Define a constructor used to initialize the attributes of the method with values entered by the user.
- C. Set the View() method to display information for the current book.
- D. The following lines should work.

```
MyBook = Book('Python Course' , 'Eric Matthes' , '23 $')  
print( MyBook.view())
```

Question 2

- A. Define a Circle class allowing to create a circleC (O, r) with center O(a, b) and radius r using the constructor:

```
def __init__(self,a,b,r):  
    self.a = a  
    self.b = b  
    self.r = r
```

- B. Define an Area() method of the class which calculates the area of the circle.
- C. Define a Perimeter() method of the class which allows you to calculate the perimeter of the circle.
- D. Define a testBelongs() method of the class which allows to test whether a point A(x, y) belongs to the circle C(O, r) or not.
(Hint equation of circle is $(x-a)^2 + (y-b)^2 - r^2 = 0$)
- E. Create a Cylinder child class inheriting from the Circle class and with a height attribute and another Volume() method to calculate the volume of the Cylinder.

Question 3

- A. Create a Python class called BankAccount which represents a bank account, having as attributes: accountNumber (numeric type), name (name of the account owner as string type), balance.
- B. Create a constructor with parameters: accountNumber, name, balance.
- C. Create a Deposit() method which manages the deposit actions.
- D. Create a Withdrawal() method which manages withdrawals actions.
- E. Create an bankFees() method to apply the bank fees with a percentage of 5% of the balance account.
- F. Create a display() method to display account details.
- G. Give the complete code for the BankAccount class.

Feel free to add any additional functionalities!