

```
In [16]: ▶ 1 # Example 01
2 class Complex:
3     def __init__(self, r, i):
4         self.real = r
5         self.img = i
6
7 c1 = Complex(5,3)
8 c2 = Complex(2,4)
9 print("sum = ", c1+c2)
```

executed in 24ms, finished 17:44:01 2020-07-06

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-16-9ae7c4278701> in <module>
      7 c1 = Complex(5,3)
      8 c2 = Complex(2,4)
----> 9 print("sum = ", c1+c2)
```

TypeError: unsupported operand type(s) for +: 'Complex' and 'Complex'

```
In [23]: ▶ 1 # Example 02
2 class Complex:
3     def __init__(self, r, i):
4         self.real = r
5         self.img = i
6
7     def __add__(self, sec):
8         r = self.real + sec.real
9         i = self.img + sec.img
10        return Complex(r,i)
11
12    def __str__(self):
13        return str(self.real)+' + '+str(self.img)+'i'
```

executed in 8ms, finished 17:51:00 2020-07-06

```
In [24]: ▶ 1 c1 = Complex(5,3)
2 c2 = Complex(2,4)
3 print(c1+c2)
```

executed in 6ms, finished 17:51:00 2020-07-06

7 + 7i

```
In [25]: 1 # Example 03
2 class Point:
3     def __init__(self, x=0, y=0):
4         self.x = x
5         self.y = y
6     def __str__(self):
7         return "({0},{1})".format(self.x, self.y)
8     def __sub__(self, other):
9         x = self.x - other.x
10        y = self.y - other.y
11        return Point(x, y)
```

executed in 10ms, finished 17:51:33 2020-07-06

```
In [26]: 1 p1 = Point(5, 4)
2         p2 = Point(4, 2)
3         print(p1-p2)
```

executed in 7ms, finished 17:51:34 2020-07-06

(1,2)

```
In [27]: 1 # Case Study 01
2 class Apple:
3     def type(self):
4         print('Fruit')
5     def color(self):
6         print('Red')
7     def taste(self):
8         print('Sweet')
9
10 class Grapes:
11     def type(self):
12         print('Fruit')
13     def color(self):
14         print('Green')
15     def taste(self):
16         print('Sour')
17
18 def fruits(fruit):
19     fruit.type()
20     fruit.color()
21     fruit.taste()
```

executed in 13ms, finished 17:52:19 2020-07-06

In [28]:

```
1 apple = Apple()
2 grapes = Grapes()
3
4 fruits(apple)
5 fruits(grapes)
```

executed in 8ms, finished 17:52:19 2020-07-06

Fruit
Red
Sweet
Fruit
Green
Sour

In [29]:

```
1 # Case Study 02
2 from abc import ABC, abstractmethod
3 class Vehicle(ABC):
4     @abstractmethod
5     def model(self):
6         pass
7     @abstractmethod
8     def color(self):
9         pass
10
11 class Car(Vehicle):
12     def model(self):
13         print('2019')
14     def color(self):
15         print('White')
16
17 class Bike(Vehicle):
18     def model(self):
19         print('2016')
20     def color(self):
21         print('Black')
```

executed in 14ms, finished 17:52:36 2020-07-06

In [30]:

```
1 bmw = Car()
2 bmw.model()
3 bmw.color()
4
5 cd = Bike()
6 cd.model()
7 cd.color()
```

executed in 7ms, finished 17:52:36 2020-07-06

2019
White
2016
Black

```
In [19]: 1 # Task 01
2 class Distance:
3     def __init__(self, feet, inches):
4         self.feet = feet
5         self.inches = inches
6
7     def __add__(self, end):
8         feet = self.feet + end.feet
9         inches = self.inches + end.inches
10        return Distance(feet, inches)
11
12    def __str__(self):
13        return "({}, {})".format(self.feet, self.inches)
```

executed in 88ms, finished 17:44:02 2020-07-06

```
In [20]: 1 p1 = Distance(4, 1)
2         p2 = Distance(11, 9)
3         print(p1 + p2)
```

executed in 120ms, finished 17:44:02 2020-07-06

(15,10)

```
In [21]: 1 # Task 02
2 class Time:
3     def __init__(self, minute, second):
4         self.minute = minute
5         self.second = second
6
7     def __sub__(self, other):
8         minute = self.minute - other.minute
9         second = self.second - other.second
10        return Time(minute, second)
11
12    def __str__(self):
13        return "({0},{1})".format(self.minute, self.second)
```

executed in 112ms, finished 17:44:02 2020-07-06

```
In [22]: 1 t1 = Time(12, 9)
2         t2 = Time(3, 1)
3         print(t1 - t2)
```

executed in 96ms, finished 17:44:02 2020-07-06

(9,8)