Lab. Python Class Basic II

1. 사용 tool
   -Jupyter Notebook
   -Microsoft Visual Studio Code

2. Code

```
class Point:
    def __init__(self, x, y):
        self.x = x
        self.y = y

    def print_pt(self):
        print(f'({self.x}, {self.y})')

    def add(self, pt):
        new_x = self.x + pt.x
        new_y = self.y + pt.y
        return Point(new_x, new_y)

    def multiply(self, factor):
        return Point(self.x * factor, self.y * factor)

    def length(self):
        return self.x ** 2 + self.y ** 2

    def get_x(self):
        return self.x

    def get_y(self):
        return self.y

    #Base Overloading Methods
    def __str__(self):
        return f'({self.x}, {self.y})'

    def __add__(self, pt):
        new_x = self.x + pt.x
        new_y = self.y + pt.y
        return Point(new_x, new_y)

    def __sub__(self, pt):
        new_x = self.x - pt.x
        new_y = self.y - pt.y
        return Point(new_x, new_y)

    def __mul__(self, factor):
        return Point(self.x * factor, self.y * factor)

    def __len__(self):
        return self.x ** 2 + self.y ** 2

    def __getitem__(self, index):
        if index == 0 : return self.x
        elif index == 1 : return self.y



p1 = Point(100, 200)
p2 = Point(300, 450)

p1.print_pt()   #(100, 200)
p2.print_pt()   #(300, 450)

print(p1)   #(100, 200)   call __str__()
print(p2)   #(300, 450)

p3 = p1.add(p2)
print(p3)     #(400, 650)

p4 = p1 + p2   #call __add__()
print(p4)     #(400, 650)

p5 = p2 - p1  #call __sub__()
print(p5)       #(200, 250)

p6 = p1.multiply(7)
print(p6)      #(700, 1400)

p7 = p1 * 7
print(p7)       #(700, 1400)
```

```
print(f'p1\'s length = {p1.length()}')   #p1's length = 50000
print(f'p1\'s length = {len(p1)}')      #call __len__()  p1's length = 50000

print(f'p1(x, y) = ({p1.get_x()}, {p1.get_y()})')   #p1(x, y) = (100, 200)
print(f'p1(x, y) = ({p1[0]}, {p1[1]})')   #p1(x, y) = (100, 200)


Refer to 3.3.8. Emulating numeric
types(https://docs.python.org/3/reference/datamodel.html?object.__add__#emulating-numeric-types)
```