Lab 07: Implementing with Polymorphism in Python.

Task 01:

Write a program to show classes of umbrella and provide the polymorphism mechanism in umbrella open(), close(), waterproof().

Code:

```
class Sun_Umbrella():
    def type(self):
        print("Umbrella Type : Sun Protection Umbrella\nName : Besroy Portable Sun Umbrella")
    def open(self):
        print("Open : It is Open manually")
    def close(self):
        print("Close : It is Close manually")
    def waterproof(self):
        print("Is it waterproof : Yes")


class Rain_Umbrella():
    def type(self):
        print("Umbrella Type : Rain Umbrella\nName : Crown Coast Travel Umbrella")
    def open(self):
        print("Open : Automatic Open")
    def close(self):
        print("Close : Clase Canopy")
    def waterproof(self):
        print("Is it waterproof : Yes")


s = Sun_Umbrella()
s.type()
s.open()
s.close()
```

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s.waterproof()

print("\n")

r = Rain_Umbrella()

r.type()

r.open()

r.close()

r.waterproof()

Output:

```
Umbrella Type : Sun Protection Umbrella
Name : Besroy Portable Sun Umbrella
Open : It is Open manually
Close : It is Close manually
Is it waterproof : Yes


Umbrella Type : Rain Umbrella
Name : Crown Coast Travel Umbrella
Open : Automatic Open
Close : Clase Canopy
Is it waterproof : Yes
```

Task 02:

Design class for classical, and latest mobiles. Use polymorphism to show the functions of these mobiles such as button() or touch(), size(), split_screen(), operating_system().

Code:

```
class Nokia():
    def keyboard(self):
        print("Keyboard: 4-way scroll key")
    def resolution(self):
        print("Resolution : 96 x 68 pixels")
    def camera(self):
        print("Camera : No")
    def operating_system(self):
        print("Operating System : Android 5.0")
    def talk_time(self):
        print("Talk Time : Up to 5hr 20 min")


class Xiaomi():
    def keyboard(self):
        print("Keyboard : Touch")
    def resolution(self):
        print("Resolution : 1080 x 2400")
    def camera(self):
        print("Camera : Front and Rear")
    def operating_system(self):
        print("Operating System : Android v10")
    def talk_time(self):
        print("Talk Time : Up to 492 Hours(2G)")


def specification(self):
    self.keyboard()
```

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```python
        self.resolution()

        self.camera()

        self.operating_system()

        self.talk_time()

        print("\n")


n = Nokia()

x = Xiaomi()


print("Nokia")

specification(n)


print("Xiaomi")

specification(x)
```

Output:

```
Nokia
Keyboard: 4-way scroll key
Resolution : 96 x 68 pixels
Camera : No
Operating System : Android 5.0
Talk Time : Up to 5hr 20 min


Xiaomi
Keyboard : Touch
Resolution : 1080 x 2400
Camera : Front and Rear
Operating System : Android v10
Talk Time : Up to 492 Hours(2G)
```

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Task 03:

Design class for Butterfly. Such that butterfly has multiple colors, patters, nature of living, origin, living_in_pupa, living_as_caterpiller.

Code:

```
class Butterfly():

    def intro(self):

        print("\t\t\t\t\t\t Butterfly")

        print("\t\t\t\t\t\t_____")


    def color(self):

        print("Color: Butterfly have multiple colors")


    def nature_of_living(self):

        print("There are four stages in the metamorphosis of butterflies.")

        print("1 : Egg\t\t\t2 : Caterpillar \t\t3 : Pupa \t\t4  : Adult \n")



    def origin(self):

        print("First Stage: \nA butterfly starts life as a very small, round, oval or cylindrical egg.\n")


    def living_in_caterpillar(self):

        print("Second Stage: \nButterfly larva eat a lot. This stage is also known as feeding stage.\n")


    def living_in_pupa(self):

        print("Third Stage: \nAll parts of a body going to remarkable transformation.This stage is also known as Transition stage.\n")


    def living_in_adult(self):

        print("Fourth Stage: \nFinally butterfly reach its last stage which is Adult. In this stage butterfly have a life of one to two week.\n")
```

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b = Butterfly()

b.intro()

b.color()

b.nature_of_living()

b.origin()

b.living_in_caterpillar()

b.living_in_pupa()

b.living_in_adult()

Output:

```
                                        Butterfly
                                        _____
Color: Butterfly have multiple colors
There are four stages in the metamorphosis of butterflies.
1 : Egg                 2 : Caterpillar                     3 : Pupa              4  : Adult

First Stage:
A butterfly starts life as a very small, round, oval or cylindrical egg.

Second Stage:
Butterfly larva eat a lot. This stage is also known as feeding stage.

Third Stage:
All parts of a body going to remarkable transformation.This stage is also known as Transition stage.

Fourth Stage:
Finally butterfly reach its last stage which is Adult. In this stage butterfly have a life of one to two week.
```

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