

## Assignment: 03

Student ID : C0930321

Student Name : Shreejana Shrestha

---

## # Objects and methods

```
python_oop.py > ...
1  x = 1
2  print(type(x))
3
4  print(type("hello"))
5
6  def hello():
7      print("hello")
8
9  print(type(hello))
10
11
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\sthas\OneDrive - Lambton College\Documents\Python\Python312\python_oop.py> python python_oop.py
<class 'int'>
<class 'str'>
<class 'function'>
```

```
11
12     string = "hello"
13     print(string.upper())
14
15
16
17
18
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

PS C:\Users\sthas\OneDrive - Lambton College\Documents\Python\Python311\m 2/python/Assignments/Assignment3/python\_1.py> python python\_1.py  
HELLO

## # Class and Methods inside class

```
python_oop.py > ...
15
16     class Dog:
17         def bark(self):
18             print("bark")
19
20     d = Dog()
21     d.bark()
22     print(type(d))
23
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

PS C:\Users\sthas\OneDrive - Lambton College\Documents\Python\Python311\m 2/python/Assignments/Assignment3/python\_oop.py> python python\_oop.py  
bark  
<class '\_\_main\_\_.Dog'>

## # \_\_init\_\_ method

python\_oop.py > ...

```
1  class Dog:
2      def __init__(self, name):
3          self.name = name
4          print(name)
5
6      def get_name(self):
7          return self.name
8
9
10 dog1_name = Dog("Tim")
11
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PC

```
PS C:\Users\sthas\OneDrive - Lambton College\l...
AppData/Local/Programs/Python/Python312/python
python/Assignments/Assignment3/python_oop.py"
Tim
```

python\_oop.py > ...

```
1  class Dog:
2      def __init__(self, name):
3          self.name = name
4          print(name)
5
6      def get_name(self):
7          return self.name
8
9
10 dog1 = Dog("Tim")
11 dog2 = Dog("Bill")
12
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

PS C:\Users\sthas\OneDrive - Lambton College\AppData/Local/Programs/Python/Python312/python/python/Assignments/Assignment3/python\_oop.py"  
Tim  
Bill

python\_oop.py > ...

```
1 class Dog:
2     def __init__(self, name):
3         self.name = name
4
5     def get_name(self):
6         return self.name
7
8
9 dog1 = Dog("Tim")
10 print(dog1.name)
11 dog2 = Dog("Bill")
12 print(dog2.name)
13
```

PROBLEMS OUTPUT TERMINAL ...

PS C:\Users\sthas\OneDrive - Lambton College\Documents\Assignment3> & C:/Users/sthas/AppData/Local/Programs/Python/Python38-64/python.exe "c:/Users/sthas/OneDrive - Lambton College/Assignment3/python\_oop.py"

○ Tim  
Bill

python\_oop.py > ...

```
1  class Dog:
12      def set_age(self, age):
13          self.age = age
14
15  d = Dog("Tim", 34)
16  print(d.get_age())
17
18  d2 = Dog("Bill", 12)
19  print(d2.get_age())
20
21  d.set_age(23)
22  print(d.get_age())
23
```

PROBLEMS

OUTPUT

TERMINAL

...



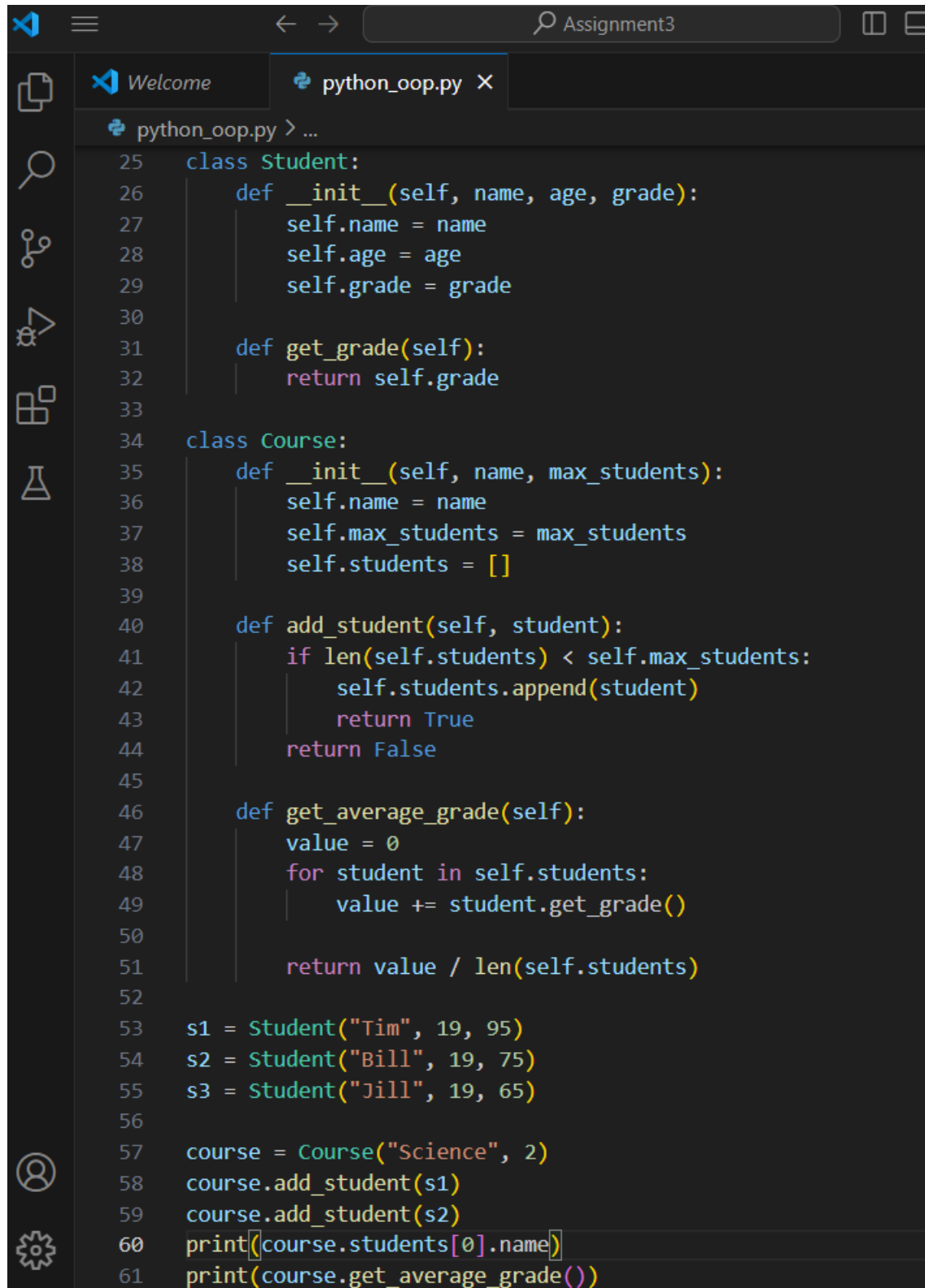
```
PS C:\Users\sthas\OneDrive - Lambton College\la
nts\Assignment3> & C:/Users/sthas/AppData/Local
python.exe "c:/Users/sthas/OneDrive - Lambton Co
Assignments/Assignment3/python_oop.py"
```

34

12

23

## # Multiple classes and adding students



```
25 class Student:
26     def __init__(self, name, age, grade):
27         self.name = name
28         self.age = age
29         self.grade = grade
30
31     def get_grade(self):
32         return self.grade
33
34 class Course:
35     def __init__(self, name, max_students):
36         self.name = name
37         self.max_students = max_students
38         self.students = []
39
40     def add_student(self, student):
41         if len(self.students) < self.max_students:
42             self.students.append(student)
43             return True
44         return False
45
46     def get_average_grade(self):
47         value = 0
48         for student in self.students:
49             value += student.get_grade()
50
51         return value / len(self.students)
52
53 s1 = Student("Tim", 19, 95)
54 s2 = Student("Bill", 19, 75)
55 s3 = Student("Jill", 19, 65)
56
57 course = Course("Science", 2)
58 course.add_student(s1)
59 course.add_student(s2)
60 print(course.students[0].name)
61 print(course.get_average_grade())
```

## Output

```
PS C:\Users\sthas\OneDrive - Lambton College\lambton  
C:/Users/sthas/AppData/Local/Programs/Python/Python.  
ambton College/lambton/Term 2/python/Assignments/As  
Tim  
85.0
```



## # Inheritance

```
Assignment3

python_oop.py x
python_oop.py > ...

68 class Pet:
69     def __init__(self, name, age):
70         self.name = name
71         self.age = age
72
73     def show(self):
74         print(f"I am {self.name} and I am {self.age} years old")
75
76     def speak(self):
77         print("I don't know what I say")
78
79 class Cat(Pet):
80     def speak(self):
81         print("Meow")
82
83 class Dog(Pet):
84     def speak(self):
85         print("Bark")
86
87 p = Pet("Tim", 19)
88 print("----- Generalized class -----")
89 p.show()
90 p.speak()
91 c = Cat("Bill", 34)
92 print("----- Cat class inherits Pet class -----")
93 c.show()
94 c.speak()
95 d = Dog("Jill", 35)
96 print("----- Dog class inherits Pet class -----")
97 d.show()
98 d.speak()
```

## # Output

```
● PS C:\Users\sthas\OneDrive - Lambton College\lambton\T  
C:/Users/sthas/AppData/Local/Programs/Python/Python312  
ambton College/lambton/Term 2/python/Assignments/Assig  
----- Generalized class -----  
I am Tim and I am 19 years old  
I don't know what I say  
----- Cat class inherits Pet class -----  
I am Bill and I am 34 years old  
Meow  
----- Dog class inherits Pet class -----  
I am Jill and I am 35 years old  
Bark
```

```
← → Assignment3
Welcome python_oop.py ×
python_oop.py > Dog > speak

68 class Pet:
69     def __init__(self, name, age):
70         self.name = name
71         self.age = age
72
73     def show(self):
74         print(f"I am {self.name} and I am {self.age} years old")
75
76     def speak(self):
77         print("I don't know what I say")
78
79 class Cat(Pet):
80     def __init__(self, name, age, color):
81         super().__init__(name, age)
82         self.color = color
83
84     def speak(self):
85         print("Meow")
86
87     def show(self):
88         print(f"I m {self.name} and I am {self.age} years old and I am {self.color}")
89
90 class Dog(Pet):
91     def speak(self):
92         print("Bark")
93
94 p = Pet("Tim", 19)
95 print("----- Generalized class -----")
96 p.show()
97 p.speak()
98 c = Cat("Bill", 34, "Brown")
99 print("----- Cat class inherits Pet class -----")
100 c.show()
101 c.speak()
102 d = Dog("Jill", 35)
103 print("----- Dog class inherits Pet class -----")
104 d.show()
```

## # Output

```
• s/AppData/Local/Programs/Python/Python312/python.exe "c:/Users/sthas/OneDrive - Lambton College/lambton/Term 2/python/Assignments/Assignment3/python_oop.py"
----- Generalized class -----
I am Tim and I am 19 years old
I don't know what I say
----- Cat class inherits Pet class -----
I m Bill and I am 34 years old and I am Brown
Meow
----- Dog class inherits Pet class -----
I am Jill and I am 35 years old
Bark
```

## # Class attributes

```
python_oop.py > ...
109
110 class Person:
111     number_of_people = 0
112
113     def __init__(self, name):
114         self.name = name
115         Person.number_of_people += 1
116
117 p1 = Person("Tim")
118 print(Person.number_of_people)
119 p2 = Person("Jill")
120
121 Person.number_of_people = 8
122 print(p2.number_of_people)
123
124 Person.number_of_people = 9
125 print(p1.number_of_people)
126
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\sthas\OneDrive - Lambton College\lambton\Term 2\python\Assignments\Assignment3> python_oop.py
1
8
9
```

## # Class methods

```
python_oop.py > ...  
109  
110 class Person:  
111     number_of_people = 0  
112  
113     def __init__(self, name):  
114         self.name = name  
115         Person.add_person()  
116  
117     @classmethod  
118     def number_of_people_(cls):  
119         return cls.number_of_people  
120  
121     @classmethod  
122     def add_person(cls):  
123         cls.number_of_people += 1  
124  
125 p1 = Person("Tim")  
126 p2 = Person("Jill")  
127 print(Person.number_of_people_())  
128  
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS  
  
PS C:\Users\sthas\OneDrive - Lambton College\lambton\Term  
s/AppData/Local/Programs/Python/Python312/python.exe "c:/u  
m 2/python/Assignments/Assignment3/python_oop.py"  
2
```

## # Static method

```
python_oop.py > Math > pr
130 # =====
131
132 class Math:
133
134     @staticmethod
135     def add5(x):
136         return x + 5
137
138     @staticmethod
139     def add10(x):
140         return x + 10
141
142     @staticmethod
143     def pr():
144         print("run")
145
146 print(Math.add5(5))
147 print(Math.add10(10))
148 Math.pr()
149
---
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PO

PS C:\Users\sthas\OneDrive - Lambton College\la  
s/AppData/Local/Programs/Python/Python312/pytho  
m 2/python/Assignments/Assignment3/python\_oop.p  
10  
20