Inspiring Excellence

Course Code:	**CSE111**
Course Title:	**Programming Language II**
Lab No:	**08**
Topic:	**OOP (Class variable and class method)**
Number of tasks:	**5**

Task 1

Write a **Student** class to get the desired output as shown below.

1. Create a Student class and a class variable called ID initialized with 0.
2. Create a constructor that takes 4 parameters: name, department, age and cgpa.
3. Write a **showDetails()** method to represent all the details of a Student
4. Write a *class method* **from_String()** that takes 1 parameter which includes name, department, age and cgpa all four attributes in string.

#Write your code here for subtasks 1-6. s1 = Student("Samin", "CSE", 21, 3.91) s1.showDetails() print("----------") s2 = Student("Fahim", "ECE", 21, 3.85) s2.showDetails() print("----------") s3 = Student("Tahura", "EEE", 22, 3.01) s3.showDetails() print("----------") s4 = Student.from_String("Sumaiya-BBA-23-3.96") s4.showDetails() ***# Write the answer of subtask 5 here*** ***# Write the answer of subtask 6 here*** **#You are not allowed to change the code above**	**OUTPUT** ID: 1 Name: Samin Department: CSE Age: 21 CGPA: 3.91 ---------- ID: 2 Name: Fahim Department: ECE Age: 21 CGPA: 3.85 ---------- ID: 3 Name: Tahura Department: EEE Age: 22 CGPA: 3.01 ---------- ID: 4 Name: Sumaiya Department: BBA Age: 23 CGPA: 3.96

5. Explain the difference between a class variable and an instance variable. Print your answer at the very end of your code.
6. What is the difference between an instance method and class method? Print your answer at the very end

Task 2

Implement the design of the **Passenger** class so that the following output is produced:

The assumption is Bus base-fare is 450 taka. A passenger can carry upto 20 kg for free. 50 taka will be added if bag weight is between 21 and 50 kg. 100 taka will be added if bag weight is greater than 50 kg.

[You are not allowed to change the code below]

# Write your code here print("Total Passenger:", Passenger.count) p1 = Passenger("Jack") p1.set_bag_weight(90) p2 = Passenger("Carol") p2.set_bag_weight(10) p3 = Passenger("Mike") p3.set_bag_weight(25) print("==========") p1.printDetail() print("==========") p2.printDetail() print("==========") p3.printDetail() print("==========") print("Total Passenger:", Passenger.count)	**Output:** Total Passenger: 0 ========== Name: Jack Bus Fare: 550 taka ========== Name: Carol Bus Fare: 450 taka ========== Name: Mike Bus Fare: 500 taka ========== Total Passenger: 3

Task 3

Implement the design of the **Travel** class so that the following output is produced:

[You are not allowed to change the code below]

# Write your code here	***Output***
print("No. of Traveller =", Travel.count) print("======================") t1 = Travel("Dhaka","India") print(t1.display_travel_info()) print("======================") t2 = Travel("Kuala Lampur","Dhaka") t2.set_time(23) print(t2.display_travel_info()) print("======================") t3 = Travel("Dhaka","New_Zealand") t3.set_time(15) t3.set_destination("Germany") print(t3.display_travel_info()) print("======================") t4 = Travel("Dhaka","India") t4.set_time(9) t4.set_source("Malaysia") t4.set_destination("Canada") print(t4.display_travel_info()) print("======================") print("No. of Traveller =", Travel.count)	No. of Traveller = 0 ====================== Source: Dhaka Destination: India Flight Time: 1:00 ====================== Source: Kuala Lampur Destination: Dhaka Flight Time: 23:00 ====================== Source: Dhaka Destination: Germany Flight Time: 15:00 ====================== Source: Malaysia Destination: Canada Flight Time: 9:00 ====================== No of Traveller = 4

Task 4

Write the **Student** class so that the given code provides the expected output.

1. Create **Student** class
2. Create 3 class variable
3. Create 1 class method for object creation
4. Create 1 class method for printing

[You are not allowed to change the code below]

```
# Write your code here

Student.printDetails()
print('############################')

mikasa = Student('Mikasa Ackerman', "CSE")
mikasa.individualDetail()
print('----------------------------------------')
Student.printDetails()

print('========================')

harry = Student.createStudent('Harry Potter', "Defence Against Dark Arts", "Hogwarts School")
harry.individualDetail()
print('----------------------------------------')
Student.printDetails()

print('========================')

levi = Student.createStudent("Levi Ackerman", "CSE")
levi.individualDetail()
print('----------------------------------------')
Student.printDetails()
```

Output:

```
Total Student(s): 0
BRAC University Student(s): 0
Other Institution Student(s): 0
##################################
Name: Mikasa Ackerman
Department: CSE
Institution: BRAC University
------------------------------------------------
Total Student(s): 1
BRAC University Student(s): 1
Other Institution Student(s): 0
================================
Name: Harry Potter
Department: Defence Against Dark Arts
Institution: Hogwarts School
------------------------------------------------
Total Student(s): 2
BRAC University Student(s): 1
Other Institution Student(s): 1
================================
Name: Levi Ackerman
Department: CSE
Institution: BRAC University
------------------------------------------------
Total Student(s): 3
BRAC University Student(s): 2
Other Institution Student(s): 1
```

Task 5

```
1  class A:
2      temp = 4
3      def __init__(self):
4          self.y = self.temp - 2
5          self.sum = self.temp + 1
6          A.temp -= 2
7          self.methodA(3, 4)
8      def methodA(self, m, n):
9          x = 0
10         self.y = self.y + m + (self.temp)
11         A.temp += 1
12         x = x + 1 + n
13         self.sum = self.sum + x + self.y
14         print(x, self.y, self.sum)
15
16 class B:
17     x = 0
18     def __init__(self, b = None):
19         self.y, self.temp, self.sum = 5, -5, 2
20
21         if b == None:
22             self.y = self.temp + 3
```

```
23                 self.sum = 3 + self.temp + 2
24                 self.temp -= 2
25             else:
26                 self.sum = b.sum
27                 B.x = b.x
28                 b.methodB(2, 3)
29         def methodA(self, m, n):
30             x = 2
31             self.y = self.y + m + (self.temp)
32             self.temp += 1
33             x = x + 5 + n
34             self.sum = self.sum + x + self.y
35             print(x, self.y, self.sum)
36         def methodB(self, m, n):
37             y = 0
38             y = y + self.y
39             B.x = self.y + 2 + self.temp
40             self.methodA(self.x, y)
41             self.sum = self.x + y + self.sum
42             print(self.x, y, self.sum)
```

```
a1 = A()
b1 = B()
b2 = B(b1)
b1.methodA(1, 2)
b2.methodB(3, 2)
```