Inspiring Excellence

Course Title: Programming Language II
Course Code: CSE 111
Semester: Summer 2020
Lab 7 Assignment

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 **get_details()** 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.	**OUTPUT**
s1 = Student("Samin", "CSE", 21, 3.91) s1.get_details() print("----------") s2 = Student("Fahim", "ECE", 21, 3.85) s2.get_details() print("----------") s3 = Student("Tahura", "EEE", 22, 3.01) s3.get_details() print("----------") s4 = Student.from_String("Sumaiya-BBA-23-3.96") s4.get_details()	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
# Write the answer of subtask 5 here	
# Write the answer of subtask 6 here	
#You are not allowed to change the code above	

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, class method and a static method? Print your answer at the very end

Task 2

Design the program to get the output as shown.

Subtasks:

1. You will need to create 2 classes: **Teacher** and **Course**
2. Make all the variables in the Teacher class **private**.
3. Make all the variables in the Course class **public**.
4. Write the required codes in the Teacher and Course classes.

[You are not allowed to change the code below]

# Write your code here for subtasks 1-4 	
 	
t1 = Teacher("Saad Abdullah", "CSE")
t2 = Teacher("Mumit Khan", "CSE")
t3 = Teacher("Sadia Kazi", "CSE")
c1 = Course("CSE 110 Programming Language I")
c2 = Course("CSE 111 Programming Language-II")
c3 = Course("CSE 220 Data Structures")
c4 = Course("CSE 221 Algorithms")
c5 = Course("CCSE 230 Discrete Mathematics")
c6 = Course("CSE 310 Object Oriented Programming")
c7 = Course("CSE 320 Data Communications")
c8 = Course("CSE 340 Computer Architecture")
t1.addCourse(c1);
t1.addCourse(c2);
t2.addCourse(c3);
t2.addCourse(c4);
t2.addCourse(c5);
t3.addCourse(c6);
t3.addCourse(c7);
t3.addCourse(c8);
t1.printDetail();
t2.printDetail();
t3.printDetail();
	==========
	Name: Saad Abdullah
	Department: CSE
	List of courses
	==========
	CSE 110 Programming Language I
	CSE 111 Programming Language-II
	==========
	==========
	Name: Mumit Khan
	Department: CSE
	List of courses
	==========
	CSE 220 Data Structures
	CSE 221 Algorithms
	CCSE 230 Discrete Mathematics
	==========
	==========
	Name: Sadia Kazi
	Department: CSE
	List of courses
	==========
	CSE 310 Object Oriented Programming
	CSE 320 Data Communications
	CSE 340 Computer Architecture
	==========

Task 3

Write a class called **Dates** with the required constructor and methods.

Subtask:

1. Create a **class** called Dates and create the required **constructor**
2. Create a **class method** called toDashDate() to replace the "/" from date to "-".
3. Create getDate() **method** to access variables.
4. In the conditional statement it prints "Equal". Explain why.

[You are not allowed to change the code below]

```
# Write your code here for subtasks 1-5

date1 = Dates("05-09-2020")
dateFromDB = "05/09/2020"
date2= Dates.toDashDate(dateFromDB)


if(date1.getDate() == date2.getDate() ):
   print("Equal")
else:
   print("Unequal")
```

Task 4

Write a class called Circle with the required constructor and methods to get the following output.

Subtasks:

1. Create a **class** called Circle.

2. Create the required **constructor**. Use **Encapsulation** to protect the variables. [**Hint:** Assign the variables in **private**]

3. Create **getRadius()** and **setRadius()** method to access variables.

4. Create a **method** called area to calculate the area of circles.

5. Handle the **operator overloading** by using a **special method** to calculate the radius and area of circle 3.

[You are not allowed to change the code below]

# Write your code here for subtasks 1-5 c1 = Circle(4) print("First circle radius:" , c1.getRadius()) print("First circle area:" ,c1.area()) c2 = Circle(5) print("Second circle radius:" ,c2.getRadius()) print("Second circle area:" ,c2.area()) c3 = c1 + c2 print("Third circle radius:" ,c3.getRadius()) print("Third circle area:" ,c3.area())	**Output:** First circle radius: 4 First circle area: 50.26548245743669 Second circle radius: 5 Second circle area: 78.53981633974483 Third circle radius: 9 Third circle area: 254.46900494077323

Task 5

Observe the given code carefully. Try to understand from the given code and the outputs what to write in your class **Dolls**.

 # Write your code here

```
obj_1 = Dolls("Tweety", 2500)
print(obj_1.detail())
if obj_1 > obj_1:
   print("Congratulations! You get the Tweety as a gift!")
else:
   print("Thank you!")

print("========================")
obj_2 = Dolls("Daffy Duck", 1800)
print(obj_2.detail())
if obj_2 > obj_1:
   print("Congratulations! You get the Tweety as a gift!")
else:
   print("Thank you!")

print("========================")
obj_3 = Dolls("Bugs Bunny", 3000)
print(obj_3.detail())
if obj_3 > obj_1:
   print("Congratulations! You get the Tweety as a gift!")
else:
   print("Thank you!")

print("========================")
obj_4 = Dolls("Porky Pig", 1500)
print(obj_4.detail())
if obj_4 > obj_1:
   print("Congratulations! You get the Tweety as a gift!")
else:
   print("Thank you!")

print("========================")
obj_5 = obj_2 + obj_3
print(obj_5.detail())
if obj_5 > obj_1:
   print("Congratulations! You get the Tweety as a gift!")
else:
   print("Thank you!")
```

Output

```
Doll: Tweety
Total Price: 2500 taka
Thank you!
========================
Doll: Daffy Duck
Total Price: 1800 taka
Thank you!
========================
Doll: Bugs Bunny
Total Price: 3000 taka
Congratulations! You get the Tweety as a gift!
========================
Doll: Porky Pig
Total Price: 1500 taka
Thank you!
========================
Dolls: Daffy Duck  Bugs Bunny
Total Price: 4800 taka
Congratulations! You get the Tweety as a gift!
```

[You are not allowed to change the code above]

Subtasks:

1. Create a Doll class.
2. Create the required constructor.
3. Write a method to print the name and the price of the object
4. Use operator overloading for the addition operators.
5. Write a method to handle operator overloading for the “>” logical operator that compares the price of the objects.

Hints:

- *Notice that the price of each object is being checked with the price of obj in the given code.*
- *Notice the word Doll in the first 4 outputs and the last output. You have to print exactly as represented here.*