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 and class 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.*