**MGIS3315: Programming for Business**

**Assignment 3: 7 Points**

**Instructions:**

* You need to write 4 python programs for assignment3. It counts for 7% of the final grade.
* You need to submit two files for this assignment: a Jupyter file with the code and a word document with screenshots of the code & output. Crop screenshots well before putting in the document.
* Name your files as: “YourName\_Assignment3”. Submit ALL questions in a SINGLE file.
* You need to submit all files in the Blackboard only. You will see a link on Blackboard to submit it. Please see the “Assignments” module. Please don’t email your assignments to me.
* Submit it before November 27, 11.59 pm. 0 points for late submissions.
* You must write comments wherever appropriate.

**Program1(1 points):**

* Write a Python class (Rectangle) that has two attributes (length, width).
* Create an *instance method (calculateAreas())* for calculating the area
* Create another *instance method* *(calculatePerimeter())* for calculating the perimeter.
* Create an object (square) and find its area and perimeter.
* Call these methods using the object and print area and perimeter of the square.
* Use 10cm as the value of length and width.

**Program2(2 points):**

class Student():

university="ABC university"

def \_\_init\_\_(self, name, sid):

self.name=name

self.sid=sid

def displayName():

# write code here to complete the method

def displayGrade():

pass

* Student class (given above) has two attributes(name, studentID). It contains two methods: displayName(), displayGrade()
* Update/override displayName() method such that it can be used to display the name attribute associated with the object.
* Create a new class (Grade) that inherits the Student class. Grade class has three attributes(name, studentID, courseGrade. Define the constructor(\_\_init\_\_ method) to initialize these attributes when objects are created.
* Create an object of the Grade class using these values for its attributes: name=”Tom”, studentID=”s1”, courseGrade=75.3
* Update/override displayGrade() in Grade class such that it calculates the letter grade based on the numeric grade. For example, if courseGrade is 75.3, then letter grade will be C
* Letter grades are decided based on the grading scale mentioned in this table:

|  |  |
| --- | --- |
| Grade | Letter Grade |
| 59.44 or less | F |
| 59.45 to 69.44 | D |
| 69.45 to 79.44 | C |
| 79.45 to 89.44 | B |
| 89.45 or more | A |

**Program3(2 points):**

* Create a class ‘Employee’ that has two attributes(name, salary). Define the constructor(\_\_init\_\_ method) to initialize these attributes when objects are created.
* Create two objects of the ‘Employee’ class: object named ‘John’ with name(John) & salary(5000.50), object named ‘Maria’ with name(Maria) & salary(4090.50).
* Write a method to define the behavior of LESS THAN (<) operator for the Employee class. Define the method such that it compares the salaries of the objects. For example, Maria < John should return TRUE because her salary of Maria is less than John's.
* Write a method to define the behavior of GREATER THAN (>) operator for the Employee class. Define the method such that it compares the salaries of the objects. For example, John > Maria should return TRUE because salary John is more than Maria.
* Use these methods and check if they are working as intended or not.
* Hint: You need to override special method: \_\_lt\_\_(), \_\_gt\_\_()

**Program4(2 points):**

* Create an GUI application using Tkinter to calculate income tax.
* This application contains 3 labels, 2 enter boxes and 1 button.
* The title of the application should be "Income tax calculator"
* It allows the user to enter name and annual salary.
* It displays income tax on Button click. Income tax is 10% of the income.
* enter name= John and income=75000 to test the application
* The application should be similar to this picture:

A screenshot of a calculator

Description automatically generated