Istanbul Medipol University
School of Engineering and
Natural Sciences
Computer Engineering

MEDİPOL
UNV İSTANBUL MEDİPOL ÜNİVERSİTESİ

Fall 2019 – Assignment #6
Introduction to Programming
Assignment Date: 25.11.2019
Due Date: 4.12.2019

Programming Assignment #6

Put all of you code into the same PYHTON file according to file name conventions given in
http://www.akyokus.com/fall2019/ip/assignments.html. Programming assignment solutions
should be submitted in the following format:

File Name: COE-64160099-KAYA-A1.py

```python
################################################################################
#  Name:          Ali Cokcalışır
#  Student ID:    6321211
#  Department:    Computer Engineering
#
#  Assignment ID: A1
################################################################################

################################################################################
#  QUESTION I
#  Description:
#  Body mass index (BMI) is a measure of health #  based on weight. It can be calculated by
#  taking your weight in kilograms and # dividing it by the square of your height in meters.
#  Write a program that prompts # the user to enter a weight in pounds and height in inches
#  and displays the BMI. Note that one pound is 0.45359237 kilograms and one inch is
#  0.0254 meters.
#
#  Sources:
#  Give references for the sources that you used in your program if there are any
#
################################################################################

print("\n")
print("SOLUTION OF QUESTION I:")
print("******************************************************************************")
# Prompt the user to enter weight in pounds
weight = eval(input("Enter weight in pounds: "))

# Prompt the user to enter height in inches
height = eval(input("Enter height in inches: "))

KILOGRAMS_PER_POUND = 0.45359237  # Constant
METERS_PER_INCH = 0.0254  # Constant

# Compute BMI
weightInKilograms = weight * KILOGRAMS_PER_POUND
heightInMeters = height * METERS_PER_INCH
bmi = weightInKilograms / (heightInMeters * heightInMeters)

# Display result
print("BMI is", format(bmi, ".2f"))
if bmi < 18.5:
    print("Underweight")
elif bmi < 25:
    print("Normal")
elif bmi < 30:
    print("Overweight")
else:
    print("Obese")
```

```
################################################################################
#  QUESTION II
#  Description:
#  You can use the math functions to solve many computational problems. Given the three
#  vertices of a triangle, for example, you can compute the angles by using
#  math formulas. The following program asks user to enter the coordinates of a triangle,
# then it computes its angles.
#
#  Sources:
#  Give references for the sources that you used in your program if there are any
#
################################################################################

print("\n")
print("SOLUTION OF QUESTION II:")
print("*****************************************************************************")
import math

x1, y1, x2, y2, x3, y3 = eval(input("Enter six coordinates of three points \
separated by commas like x1, y1, x2, y2, x3, y3: "))

a = math.sqrt((x2 - x3) * (x2 - x3) + (y2 - y3) * (y2 - y3))
b = math.sqrt((x1 - x3) * (x1 - x3) + (y1 - y3) * (y1 - y3))
c = math.sqrt((x1 - x2) * (x1 - x2) + (y1 - y2) * (y1 - y2))

A = math.degrees(math.acos((a * a - b * b - c * c) / (-2 * b * c)))
B = math.degrees(math.acos((b * b - a * a - c * c) / (-2 * a * c)))
C = math.degrees(math.acos((c * c - b * b - a * a) / (-2 * a * b)))

print("The three angles are ", round(A * 100) / 100.0,
      round(B * 100) / 100.0, round(C * 100) / 100.0)


################################################################################
#  QUESTION III
#  Description:
#  Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt
#  ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation
#  ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in
#  reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.
#  Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit
#  anim id est laborum
#
#  Sources:
#  Give references for the sources that you used in your program if there are any
#
################################################################################
print("\n")
print("SOLUTION OF QUESTION III:")
print("*****************************************************************************")
```

Submit your programming assignment through the Google classroom IntProg-Fall2019 (https://classroom.google.com/c/NDMyNjgzODE5MjNa).

QUESTION I (20p) :

(The Rectangle class) Design a class named Rectangle to represent a rectangle. The class contains:

- Two data fields named **width** and **height**.
- A constructor that creates a rectangle with the specified **width** and **height**. The default values are **1** and **2** for the **width** and **height**, respectively.
- A method named **getArea()** that returns the area of this rectangle.
- A method named **getPerimeter()** that returns the perimeter.

Write a test program that creates two Rectangle objects—one with width 4 and height 40 and the other with width 3.5 and height 35.7. Display the width, height, area,and perimeter of each rectangle in this order.

QUESTION II (20p) :

(The Stock class) Design a class named Stock to represent a company's stock that contains:

- A private string data field named **symbol** for the stock's symbol.
- A private string data field named **name** for the stock's name.
- A private float data field named **previousClosingPrice** that stores the stock price for the previous day.
- A private float data field named **currentPrice** that stores the stock price for the current time.
- A constructor that creates a stock with the specified symbol, name, previous price, and current price.
- A get method for returning the stock name.
- A get method for returning the stock symbol.
- Get and set methods for getting/setting the stock's previous price.
- Get and set methods for getting/setting the stock's current price.
- A method named **getChangePercent()** that returns the percentage changed from **previousClosingPrice** to **currentPrice**.

Write a testprogram that creates a Stock object with the stock symbol INTC, the name Intel Corporation, the previous closing price of 20.5, and the new current price of 20.35, and display the price-change percentage.

QUESTION III (10p) :

(Longest common prefix) Write a method that returns the longest common prefix of two strings. For example, the longest common prefix of distance and disinfection is dis. The header of the method is:

def prefix(s1, s2)

If the two strings have no common prefix, the method returns an empty string.Write a main method that prompts the user to enter two strings and displays their common prefix.

QUESTION IV (50p) :

A county collects property taxes on the assessment value of property, which is 60 percent of the property's actual value. If an acre of land is valued at $10,000, its assessment value is $6,000. The property tax is then $0.75 for each $100 of the assessment value. The tax for the acre assessed at $6,000 will be $45.00.

Write a GUI program that displays the assessment value and property tax when a user enters the actual value of a property as follows:
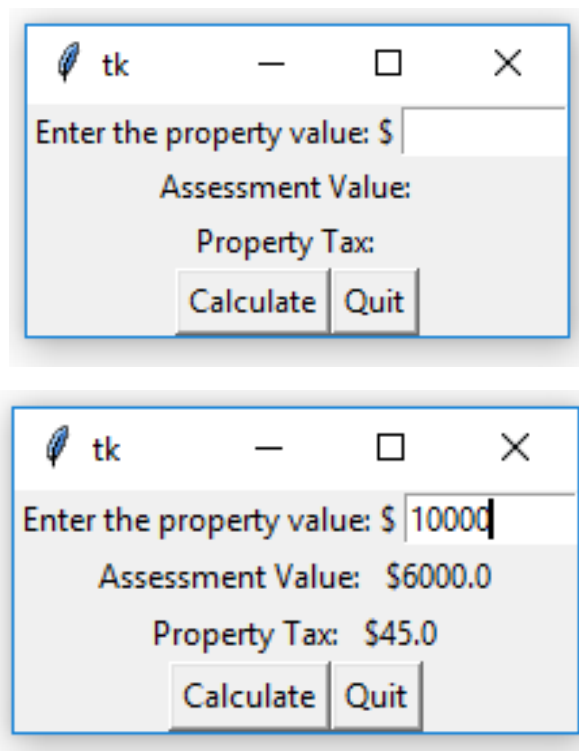
After entering an actual property value, you should press "Calculate" button to calculate the assessment value and property tax. The calculated results will be displayed on the window. When you press "Quit" button, the program should close the window.