Istanbul Medipol University
School of Engineering and
Natural Sciences
Computer Engineering

MEDİPOL
UNV İSTANBUL MEDİPOL ÜNİVERSİTESİ

Fall 2022 – Assignment #1
Introduction to Programming
Assignment Date: 11.10.2022
Due Date: 24.10.2022

Programming Assignment #1

QUESTION I:

Write a program that displays the following table:

```
a        a^3      a^4
1        1        1
2        8        16
3        27       81
4        64       256
```

QUESTION II:

An approximate value of π number can be computed using the following formula:

$$\pi = 4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \ \cdots \ \right)$$

Write a program that displays the result of $4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} \right)$.

and $4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \frac{1}{13} - \frac{1}{15} \right)$.

QUESTION III:

Write a program that prompts the user to enter a six-digit integer and displays the number in reverse order. Here is a sample run (do not use loops. You may use remainder and integer divison operations):

Enter an integer: 142376

6
7
3
2
4
1

QUESTION IV:

   a. Write a program that receives a UNICODE code and displays its character. For example, if the user enters **351**, the program displays the character **Ş**. Here is a sample run:

   Enter an UNICODE code: 351
   The character is Ş

   b. Write a turtle program to display Arabic characters ج, ش and greek characters Δ, δ, φ.

QUESTION V:

Write a program that generates the following figures by using the turtle graphics library.
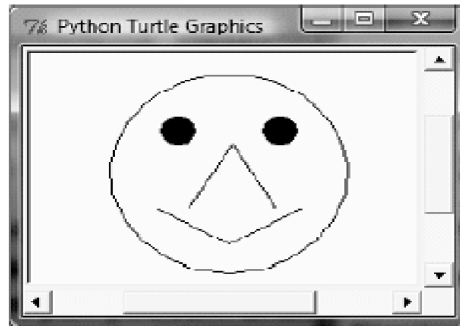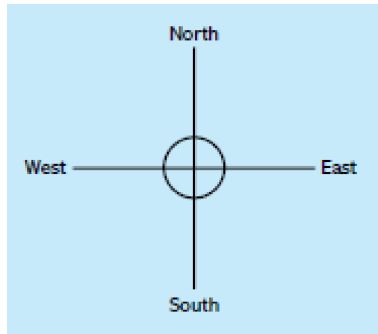
INSTRUCTIONS

Put all of you code into the same PYHTON file according to file name conventions given in . Programming assignment solutions should be submitted in the following format:

File Name: COE-6416O099-KAYA-A1.py

```
###############################################################################
#  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
```

```python
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 team FALL22-IP-PROGASSGN