

Programming Assignment #1

Put all of your code into the same PYTHON 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

```
#####
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# 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:

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:

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

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 five-digit integer and displays the number in reverse order. Here is a sample run:

Enter an integer: 67324

6
7
3
2
4

QUESTION IV:

Write a program that receives an UNICODE code (an integer between 0 and) and displays its character. For example, if the user enters 351, the program displays the character §. Here is a sample run:

Enter an UNICODE code: 351

The character is §

QUESTION V:

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

