Introduction to Programming with Python

Weekly Programming Assignment – Week 3

All solution files [Exercises 1 – 4] must be submitted at CodeGrade enabled Link for grading.
*The solution code for exercise 5 must be uploaded in Moodle as **"ex5_week3.txt"** submission page for manual grading.*
All solutions must be uploaded on or before 29th of September 2021 at 11:59 PM

Exercise 1

Write a program that prompts the user to enter any three integers as input and print the **biggest number** of those three. **Here is the sample run**:

```
>>> %Run Ex1_Week3.py
    Enter x value:2
    Enter y value:3
    Enter z value:1
    3
>>> %Run Ex1_Week3.py
    Enter x value:4
    Enter y value:4
    Enter z value:4
    4
>>> %Run Ex1_Week3.py
    Enter x value:5
    Enter y value:-7
    Enter z value:2
    5
>>> %Run Ex1_Week3.py
    Enter x value:3
    Enter y value:-3
    Enter z value:0
    3
```

Exercise 2 (Refer Exercise 2 of Week 2 programming assignment)

Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters. Write a program that prompts the user to enter a weight in pounds **(float)** and height in inches **(int)** and display the **BMI** and its **interpretation** based on the details given in the table. Note that one pound is **0.45359237** kilograms, and one inch is **0.0254** meters. The interpretation of BMI is as follows:

BMI	Interpretation
below 16	Seriously underweight (SUW)
16-18	underweight (UW)
18-24	normal weight (NW)
24-29	overweight (OW)
29-35	seriously overweight (SOW)
above 35	gravely overweight (GOW)

Here is the sample run:

```
Enter your weight in pounds:95.5
Enter your height in inches:50
your BMI is: 26.857257942215885
OW
>>> %Run Ex2_week3.py
Enter your weight in pounds:95.5
Enter your height in inches:25
your BMI is: 107.42903176886354
GOW
>>> %Run Ex2_week3.py
Enter your weight in pounds:70
Enter your height in inches:50
your BMI is: 19.68594822989646
NW
>>> %Run Ex2_week3.py
Enter your weight in pounds:85
Enter your height in inches:30
your BMI is: 66.40101585480949
GOW
>>> %Run Ex2_week3.py
Enter your weight in pounds:56
Enter your height in inches:50
your BMI is: 15.74875858391717
SUW
```

Exercise 3

Every item in **10€-shop** costs 10.0 **euros** each. However, discounts are given when buying more than 1 item as shown below.

Number of items	Discount
2-3	5%
4-5	10%
6 or more	20%

For example, the cost is 19**€** if the customer buys 2 items (5% discount on 20**€)**, 36**€** (10% discount on 40**€**) if the customer buys 4 items, and 80**€** (20% discount on 100**€**) if the customer buys 10 items. Write code to **compute and print** the cost for the specified number of items. Here is the sample run:

```
Enter number of items bought:0
number of items bought: 0
cost: 0.0
>>> %Run Ex3_Week3.py
Enter number of items bought:3
number of items bought: 3
cost: 28.5
>>> %Run Ex3_Week3.py
Enter number of items bought:1
number of items bought: 1
cost: 10.0
>>> %Run Ex3_Week3.py
Enter number of items bought:6
number of items bought: 6
cost: 48.0
>>> %Run Ex3_Week3.py
Enter number of items bought:5
number of items bought: 5
cost: 45.0
>>> %Run Ex3_Week3.py
Enter number of items bought:2
number of items bought: 2
cost: 19.0
```

Exercise 4

The XYZ electricity company computes energy consumption (in units) fee on monthly basis. The computation for subunits of energy consumption is given here.

Consumption in unit	Charge
upto 50 (0-50)	0.060 € per unit
next 50 – 100 (51 -100)	0.070 € per unit
next 100 – 175 (101-175)	0.085 € per unit
above 175	(0.095 € per unit) + 1€ for over consumption

In addition to energy consumption fee, customer has to pay **2€** for energy transfer and **50 cents** for admin fee every month. Write code that prompts customer's energy consumption unit in integer as input and prints the amount that to be paid by customer. Here is the sample run:

```
>>> %Run Ex4_Week3.py

 Enter the energy units consumed:45
 amount to  be paid: 5.199999999999999

>>> %Run Ex4_Week3.py

 Enter the energy units consumed:70
 amount to  be paid: 6.9

>>> %Run Ex4_Week3.py

 Enter the energy units consumed:125
 amount to  be paid: 11.125

>>> %Run Ex4_Week3.py

 Enter the energy units consumed:220
 amount to  be paid: 20.65

>>>
```

Hint: The calculation for energy consumption **unit:125** is (50*0.060) +(50*0.070)+(25*0.085) + 2.5 (transfer+ admin fee) = 11.125€. The example given here is for demonstration purposes only.

Exercise 5* : Menu based coding (*Should upload the solution code at Moodle as "ex5_week3.txt" at submission page- on or before due date***).**

Your program must display an interactive menu containing 3 options. An example of what your menu (use *if* statement) would look like is displayed below.

Main Menu:

1) Replace second string
2) Exciting summer job
3) Exit
Select your option:

Your program must allow the user to select these options by typing the number and hitting enter. Upon completion of all options except Exit, the user is returned to the main menu.

Option #1 requirement

This part of the program prompts the user to enter two strings (namely *first string and second string*) as input. The program then replaces all the occurrences of *second string* from the first string, surrounded by double quotes. Example run here:

```
Give the first string:Is here or are there
Give the replace string to be in double quotes:e
Replaced string: Is h"e"r"e" or ar"e" th"e"r"e"
```

Option #2 requirement

This part of the task will test your programming skills in handling user input, performing basic arithmetic calculations, using decision statements, and producing formatted output.

You found an exciting summer job for five weeks. It pays 15.50€ per hour. Suppose that the total tax you pay on your summer job income is 14%. After paying the taxes, you spend 10% of your net income to buy new clothes and other accessories for the next school year and 1% to buy schools supplies. After buying clothes and school supplies,

a) If you spend less than 25% of your net income to buy savings bonds, your parents spend 0.25€ for each euro you spend to buy saving bonds, plus money equal to 1 % of the money you save after paying taxes and buying clothes, school supplies and other accessories.

b) If you spend exactly 25% of your net income to buy savings bonds, your parents spend 5.0€ to buy additional savings bonds for you.

c) If you spend more than 25% of your net income to buy savings bonds your parents spend 0.40€ for each euro you spend to buy savings bonds plus money equal to 2% of the money you save after paying taxes and buying clothes, school supplies and other accessories.

d) If you do not spend any money to buy savings bonds, then because you had a summer job, your parents buy savings bonds for you in an amount equal to 1% of the money you save after paying taxes and buying clothes, other accessories and school supplies.

Write a program that prompts the user to enter your name, total number of hours that you worked for 5 weeks and amount that you spent to buy saving bonds in €. The program then outputs the following:

Sample Input/Output (Input is underlined)

```
Your name: Ashok Kumar

Hours worked for 5 weeks:50

Spent money on buying saving bonds in € (if doesn't -
enter 0):0
```

Output:

```
Name: Ashok Kumar
Income before tax: 775.00
Income after tax: 666.50
Money spent on cloths and accessories: 66.65
Money spent on school supplies: 6.66
Money spent on savings bonds: 0.00
Money spent by parents to buy additional savings bonds:
5.93
```

Note:

The input/output values shown in the tables above are for demonstration purposes only – the values may vary based on what the user enters, but you can assume they will always be correctly entered as positive integers (no validation is required).

Hint: Net income = (income) –(income*14%) → for demonstration purposes only.

Option #3 requirement

This part of the program gets executed when the user enters 3 as option then program end with message "Bye from Menu- See you again".

Marking guide for Exercise 5:

Items	**Check if completed**	**Possible points**	**Actual points**
Main menu – Design and asking user option as input		2	
Return to Main menu		2	
Option 1 – Replace second string			
i. Input statements		1	
ii. process and Output statement		4	
Option 2 – Exciting summer job			
i. Input & output statements		2	
ii. calculation of net income without bond purchase		2	
iii. conditions (a) and (b)		2	
iv. conditions (c) and (d)[provided (a) and (b) also correct		4	
Option 3 – Exit		1	
		Total	

Grading table for Week 3 Programming assignment

Exercise / task Number	Codegrade link_Moodle for file solution files upload	Points / Marks
1	Exercise1_Week 3	10
2	Exercise2_Week 3	10
3	Exercise3_Week 3	15
4	Exercise4_Week 3	15
5*	Exercise5_Week 3	20
* Marked will be manually graded after the due date		