Programming Fundamentals LAB – BSDSF21

(Both Morning and Afternoon)

Lab 05 – 10-02-2022

YOU may USE Command Prompt to interpret and execute all the PYTHON programs. Use of any IDE, except ***Mu Editor*** is not allowed for this LAB, despite you are expert. Unless and until you convinced me in personal capacity.

You should code all the task using functions, without functions submission will leads of a panelty in terms of deduction of marks from 10 to 40.

Tasks 1 (10 each)

1. The following formula can be used to determine the distance an object falls due to gravity in a specific time period, starting from rest:

$$d = \frac{1}{2}gt^2$$

   The variables in the formula are as follows: d is the distance in meters, g is 9.8, and t is the amount of time in seconds, that the object has been falling. Write a function named ***falling_distance*** that accepts an object's falling time in seconds as an argument. The function should return the distance in meters that the object has fallen during that time interval. Write a program that calls the function in a loop that passes the values 1 through 10 as arguments and displays the return value in each case.

2. Write statements to compute and display the duration **t'** of **t** years in a spaceship moving at speed **v**. In following formula, **c** is a constant (299,792,458 m/s) and values of **t** and **v** should be taken by user.

$$t' = t\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$$

3. Compute and display the net (final) price based on ***quantity***, ***rate***, and ***appropriate discount***. Store is offering 4% discount on purchase quantity above 5 units and 12% discount on purchase quantity above 25 units. The ***quantity*** and ***rate*** are inputs.

4. Write a program to get any 10 numbers from user, and then display them in reverse order of their entry.

5. Write a program to store 1st 25 ***Fibonacci*** numbers in an array, and later compute and print sum of them.

Tasks 2 (15 each)

6. Write a program that creates a reasonable size array, compute the mean (average) of number stored in array and later count the items of array which are larger than mean.

7. Define a function ***isSorted(a, n)*** that return True when the ***array a*** with ***data of size n*** is stored in it is sorted in ascending order. Otherwise, it returns False. The program also has a ***main*** function to create, input, test is Sorted and output the result.

Tasks 3 (20)

8. Write a program to enter your expected sessional/25, mid/35 and final/40 marks for all the subjects you are studying/learning in this semester. Later, program compute and store each subject/100. The final output of the program is as follows:

Subject	Mid	Final	Sessional	Total
PF	22	32	18	72
IICT	30	32	23	75

Thanks, for your **patience**