

Programming Fundamentals LAB – BSDSF23

(Both Morning and Afternoon)

Lab 05 – 10-10-2023

Note: YOU may USE Command Prompt or *Mu Editor* 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 of it personally.

Also note, if the computer systems are not equipped with python interpreter, you may use online compiler at the following URL highlighted in yellow. And in case it is also difficult to use for any reason, you need to do the paperwork within the LAB time for all tasks, as discussed in the class sessions. Thanks

<https://www.programiz.com/python-programming/online-compiler/>

Tasks (10 each)

[Sequence structure]

1. One acre of land is equivalent to 43,560 square feet. Write a program that asks the user to enter the total square feet in a tract of land, and then calculates and display the number of acres in the tract.
2. Write a program that calculates the total amount of a meal purchased at a restaurant. The program should ask the user to enter the charge for the food, and then calculate the amount of a 15 percent tip and 7 percent sales tax. Display each of these amounts and the total (sum of all three mentioned above).
3. Write a program that converts Celsius temperatures to Fahrenheit temperatures using the formula given below. The program should ask the user to enter a temperature in Celsius, and then display the temperature converted to Fahrenheit.

$$F = \frac{9}{5}C + 32$$

4. There are three seating categories at a stadium. For a softball game, Class A seats cost \$15, Class B seats cost \$12, and Class C seats cost \$9. Write a program that asks how many tickets for each class of seats were sold, and then displays the amount of income generated from ticket sales.

[Selection structure]

5. The date June 10, 1960 is special because when it is written as 10/6/60, the month times the day equals the year. Design a program that asks the user to enter a month (in numeric form), a day, and a two digit year. The program should then determine whether the

month times the day equals the year. If so, it should display a message saying the date is magic. Otherwise, it should display a message saying the date is not magic.

6. Create a change-counting game that gets the user to enter the number of coins required to make exactly one dollar. The program should prompt the user to enter the number of pennies (1/100 dollars), nickels (1/20 dollars), dimes (1/10 dollars), and quarters (1/4 dollars). If the total value of the coins entered is equal to one dollar, the program should congratulate the user for winning the game. Otherwise, the program should display a message indicating whether the amount entered was more than or less than one dollar.

[Iteration structure]

7. Write a program to display the Celsius temperatures from 0 to 100 and corresponding to Fahrenheit temperatures. Formula to be used is already given in task 3.
8. Write a program that asks the user to enter a series of positive numbers. The user should enter a negative number to signal the end of the series. Later program should to print the count, sum, average, and product of the positive numbers entered by user.

[Functions]

9. Write a **function isPerfectSquare(n)** to return True or False depending parameter n is a perfect square or not. A perfect square is an integer which is multiple of two same integers, e.g., 1,4,9,16, 25,36, ... are perfect squares. Also, write verity of test cases.
10. 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 the acceleration due to gravity and it is 9.8 ms^{-2} , and t is the amount of time in seconds, that the object has taken during the free fall. 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.

Thanks, for your patience