LAB (2)

Python Fundamentals

Basics:

1. Write a program that accepts a length in inches and prints the length in centimeters (1 inch = 2.54cm).
   Note: *use float() for real numbers not int() when casting the data type in input statement, and add {:.2f} in print statement for two decimal places.*
2. Write a program that converts temperatures from Celsius to Fahrenheit.
3. Write a program that calculates the volume of a sphere.
4. Write a program to calculate and display an employee's gross and net pay. In this scenario, tax is deducted from the gross pay at a rate of 20% to give the net pay.
5. Write a program to print the numbers 1 - 10 to the screen.
6. Write a program that accepts a number from the user until a negative number is entered.
7. Write a program that accepts an integer and prints the specified range it belongs to.

- Range 1: 0 to 10
- Range 2: 11 to 20
- Range 3: 21 to 30
- Range 4: 31 to 40

Strings:

1. Write a Python program to reverse a string.
   Sample String : "1234abcd"
   Expected Output : "dcba4321"
2. Write a Python function that accepts a string and counts the number of upper- and lower-case letters.
   Sample String : 'The quick Brow Fox'
   Expected Output :
   No. of Upper case characters : 3
   No. of Lower case Characters : 12
3. Write a Python function that checks whether a passed string is a palindrome or not.
   Note: *A palindrome is a word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run.*

Lists

1. Write a Python function that takes a list and returns a new list with distinct elements from the first list.
   Sample List : [1,2,3,3,3,3,4,5]
   Unique List : [1, 2, 3, 4, 5]
2. Write a Python program to print the even numbers from a given list.
   Sample List : [1, 2, 3, 4, 5, 6, 7, 8, 9]
   Expected Result : [2, 4, 6, 8]
3. Write a Python function to find the kth largest element in a list.

4. Write a Python function to check if a list is a palindrome or not. Return true otherwise false.
5. Write a program that stores a shopping list of 10 items. Print the whole list to the screen, then print items 2 and 8.
6. Extend the previous program, to insert an item into the list.

Dictionary:

1. Write a Python script to sort (ascending and descending) a dictionary by value.
2. Write a Python script to check whether a given key already exists in a dictionary.
3. Write a Python program to iterate over dictionaries using for loops.
4. Generate Dictionary of Numbers and Their Squares.
5. Write a program that adds some employee data to a dictionary. Use an employee number as the key.

Functions:

1. Write a program that accepts a number from the user and uses a function to square the number then return the result. Print the result to the screen.
2. Write a function that returns the largest of two numbers. Test the function and print the results to the screen.

OOP:

1. Write a Python program to create a class representing a Circle. Include methods to calculate its area and perimeter.
2. Write a Python program to create a person class. Include attributes like name, country and date of birth. Implement a method to determine the person's age.
3. Write a Python program to create a calculator class. Include methods for basic arithmetic operations.
4. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.