Python Programming

Practice – 4

Overview

This practice reinforces us to understand the need and creation of user-defined functions or custom functions in Python.

- *Define and invoke functions.*
- *Passing parameters and returning values from functions.*
- *Default argument values and Keyword arguments.*
- *Building functions with arbitrary number of arguments.*
- *Building short anonymous functions.*

We shall put these features and build user-defined Python functions.

Hands On

1. Write user-defined function for the following

   To display a message

   ```
   "Welcome to BANGALORE"
   "Have a nice day!"
   ```

2. Write a function which finds the cubes of numbers from 1 to 5.

3. Write a function to do the following tasks

   [a] Check if the year passed as an argument is a leap year or not.
   [b] Check if the integer passed as an argument is Prime or not.
   Return a Boolean value.

4. Write a function to determine the roots of a quadratic equation.

5. Write a function which returns a tuple of the indices of the two smallest values in list.

6. Write a function to check the given character is:

   [a] A upper case letter,
   [b] A lower case letter,
   [c] A digit or
   [d] A special symbol

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7. Write a function with default argument value to compute simple interest. The default rate of interest is 10% otherwise the user specifies it.

8. Write a function with default arguments to print the specified character, the specified number of times.

   The default character is " * " and the default number is 40

9. Write a function which takes two argument, the first being the temperature and the second being the character to indicate whether the temperature is in Fahrenheit (F) or Celsius (C).

   If the temperature is in Fahrenheit, the function should calculate and return the Celsius equivalent and vice-versa.

```
*Celsius = ( 5.0 / 9.0 ) * ( Fahrenheit – 32.0 )
*Fahrenheit = (( 9.0 / 5.0 ) * Celsius ) + 32.0
```

   Use the keyword argument mechanism to implement the function.

10. Write a function which takes three argument, the first being the title, the second being the name and the third being the message.

```
Message(title, name, msg)
```

    Use the keyword argument mechanism and display the information with the following print function:

```
print( "%s %s \n %s"  % (title, name, msg))
```

11. Write a recursive function to find the factorial of a number.

    [a] Check if the function is working properly or not.
    [b] Find the Binomial co-efficient `nCr = n! / (n – r )! * r!`

12. Write a recursive function to find the GCD of two positive numbers.

    [a] Using the above function find the `LCM = ( m * n ) / GCD(m, n)`

13. Write a recursive function to get the Nth Fibonacci number.

14. Write a recursive function to solve the problem of **Tower of Hanoi**.

15. Using the variable argument list mechanism write a function which returns the sum of all the integers passed to it as arguments.

16. Write Python program to illustrate the different type of scopes for a variable and the usage of global statement.

17. Modify the Tower of Hanoi recursive function such that function also gives a count of the number of disk moves. The count is held in a global variable.

18. Demonstrate the use of anonymous function using lambda.

    [a] To find the area of a right angle triangle
    [b] To find the volume of a box.
    [c] To convert inches to centimeters.

19. Provide document strings for all the above user-defined functions with text indicating their usage.