Ch01_Introduction_Functions and Modules

September 5, 2018

1 Functions

```
In [20]: def thing():    # function header {def, function name, function argumets  }
             print ('Hello ', end='')    # function body
             print ('World')



         thing() # function calling
```

```
Hello World
```

```
In [13]: def print_Sms():
             print ("Welcome to Python PD session")
             print ("Jan 2017\n")

         print ("\nPD Session on HCT Dubai")
         print_Sms()
```

```

PD Session on HCT Dubai
Welcome to Python PD session
Jan 2017

```

```
In [18]: def sumvalues(x,y):
             print ('The summation of ',x,'+',y,'= ', end='')
             return x+y

         a=5
         b=a+2
         print (sumvalues(a,b) ) # Function calling
```

```
The summation of  5 + 7 = 12
```

```
In [3]: def Details(name, mark):
            if mark>60:
                print ("Congratulation ",name," you pass the course")
            else:
                print ("Unfortunately ",name," you didnt pass the course")
```

```
In [4]: Details("Ossama", 90)
```

```
Congratulation  Ossama  you pass the course
```

```
In [5]: Details( 90,"Ossama")
```

```
        ---------------------------------------------------------------------------

        TypeError                                 Traceback (most recent call last)

        <ipython-input-5-095c843850f3> in <module>()
    ----> 1 Details( 90,"Ossama")


        <ipython-input-3-1e8045027d0a> in Details(name, mark)
          1 def Details(name, mark):
    ----> 2     if mark>60:
          3         print ("Congratulation ",name," you pass the course")
          4     else:
          5         print ("Unfortunately ",name," you didnt pass the course")


        TypeError: '>' not supported between instances of 'str' and 'int'
```

```
In [6]: Details( mark=90, name="Ossama")
```

```
Congratulation  Ossama  you pass the course
```

```
In [7]:
```

```
        ---------------------------------------------------------------------------

        TypeError                                 Traceback (most recent call last)

        <ipython-input-7-b5eaae6e7476> in <module>()
    ----> 1 Details( "Ossama")


        TypeError: Details() missing 1 required positional argument: 'mark'
```

```
In [9]: def Details(name, mark):
            if mark>60:
                print ("Congratulation ",name," you pass the course")
            else:
                print ("Unfortunately ",name," you didnt pass the course")
```

```
In [10]: Details( "Ossama")
```

```
        ---------------------------------------------------------------------------

        TypeError                                 Traceback (most recent call last)

        <ipython-input-10-b5eaae6e7476> in <module>()
    ----> 1 Details( "Ossama")


        TypeError: Details() missing 1 required positional argument: 'mark'
```

```
In [11]: def Details(name, mark=0):
             if mark>60:
                 print ("Congratulation ",name," you pass the course")
             else:
                 print ("Unfortunately ",name," you didnt pass the course")
```

```
In [12]: Details( "Ossama")
```

```
Unfortunately  Ossama  you didnt pass the course
```

```
In [1]: max('Welcome to Egypt')
```

```
Out[1]: 'y'
```

```
In [2]: min(3,5,8,9,100,2)
```

```
Out[2]: 2
```

```
In [3]: len('Welcome to Egypt')
```

```
Out[3]: 16
```

```
In [8]: mark=input("Enter your exam mark: ")
        mark=float(mark)
        if (mark>59.5):
            print ("Pass")
        else:
            print ("Fail")
```

```
Enter your exam mark: 55
Fail
```

2 Convert Celsius to Fahrenheit

2.1 F = 1.8 C + 32

```
In [9]: value = input("Enter the Celsius value: ")
        c = int(value)
        f = 1.8 * (c) + 32
        print (c , " Celsius = ", f ,   "Fahrenheit")
```

```
Enter the Celsius value: 3
3  Celsius =  37.4 Fahrenheit
```

```
In [2]: import random
        for i in range(5):
            x = random.random()
            print (x)
```

```
0.9743073233004959
0.8717800197648119
0.16804156882252586
0.11293371207526814
0.5732777436707432
```

```
In [4]: import random
        for i in range(5):
            x = random.random()
            print (round(x,3))
```

```
0.524
0.109
0.976
0.866
0.278
```

```
In [5]: random.randint(5, 10)
```

```
Out[5]: 9
```

```
In [9]: random.randint(5, 10)
```

```
Out[9]: 5
```

```
In [7]: random.randint(5, 10)
```

```
Out[7]: 10
```

```
In [12]: random.randint(5, 10)
```

```
Out[12]: 10
```

```
In [16]: t = [30, "Omar", 7, 10]
         random.choice(t)
```

```
Out[16]: 10
```

```
In [17]: random.choice(t)
```

```
Out[17]: 'Omar'
```

```
In [18]: random.choice(t)
```

```
Out[18]: 7
```

```
In [23]: import math
         value = 120
         decibels = 10 * math.log10(value)
         print (decibels)
```

```
20.791812460476248
```

```
In [24]: degrees = 45
         radians = degrees / 360.0 * 2 * math.pi
         val= math.sin(radians)
         print (val)
```

```
0.7071067811865475
```

```
In [30]: print (math.sqrt(16))
```

```
4.0
```

```
In [34]: # Anonymous Function  Definiton
         summation=lambda val1, val2: val1 + val2

         #Calling summation as a function
         print ("The summation of 7 + 10 = ", summation(7,10)  )
```

```
The summation of 7 + 10 =  17
```

```
In [35]: quiz = 50
         def readgrade():
             quiz = input("Enter your quiz mark: ")
             quiz = int(quiz)
             print ("Your quiz score is ", quiz)

         readgrade()
         print ("Your quiz score is ", quiz)
```

```
Enter your quiz mark: 70
Your quiz score is  70
Your quiz score is  50
```

```
In [ ]: print ("\n******** Greeting ***********")
        def greeting(lang):
            if lang=='es':
                print ('Hola')
            elif lang=='fr':
                print ('Bonjour')
            else:
                print ('Hello')

        greeting('en')
        greeting('es')
        greeting('fr')
```

```
In [1]: def computepay(hours, rate):
            if hours>40:
                pay= 40 * rate + (rate*1.5) * (hours-40)
            else:
                pay= hours * rate
            return pay


        hours = input ('Enter Hours: ')
        try:
            hours = int(hours)
        except:
            print ("Incorrect hours number !!!!")

        try:
            rate = input ("Enter Rate: ")
            rate=float(rate)
        except:
            print ("Incorrect rate !!")

        fullpay =computepay(hours, rate)

        print ("Gross Pay: ", fullpay)
```

```
Enter Hours: 50
Enter Rate: 10
Gross Pay:  550.0
```

2.2 Exrcises

2.2.1 find the Highest Common Factor of two values.

```
In [5]: def HCF(x, y):
            if x > y:
                smaller = y
            else:
                smaller = x
            for i in range(1,smaller + 1):
                if((x % i == 0) and (y % i == 0)):
                    HCF = i
            return HCF

        Number1 = int(input("Enter first number: "))
        Number2 = int(input("Enter second number: "))
        print("The Highest Common Factor of", Number1,"and", Number2,"is", HCF(Number1, Number2)
```

```
Enter first number: 36
Enter second number: 16
The Highest Common Factor of 36 and 16 is 4
```

```
In [6]: #Find Factorial of Number Using Recursion
```

```
In [9]: def RecurFactorial(n):
            if n == 1:
                return n
            else:
                return n*RecurFactorial(n-1)

        # read the value from the user
        Number = int(input("Enter a number: "))

        # check is the number is negative
        if Number < 0:
            print("Sorry, factorial does not exist for negative numbers")
        elif Number == 0:
            print("The factorial of 0 is 1")
        else:
            print("The factorial of",Number,"is",RecurFactorial(Number))
```

```
Enter a number: 5
The factorial of 5 is 120
```

```
In [12]: def RecurFibo(n):
             if n <= 1:
                 return n
             else:
                return(RecurFibo(n-1) + RecurFibo(n-2))

        # read input from the user
        nlength = int(input("Enter your length? "))
        # check if the number of terms is valid
        if nlength <= 0:
            print("Plese enter a positive integer")
        else:
            print("Fibonacci sequence:")
            for i in range(nlength):
                print(RecurFibo(i), end=' , ')
```

```
Enter your length? 10
Fibonacci sequence:
0 , 1 , 1 , 2 , 3 , 5 , 8 , 13 , 21 , 34 ,
```

2.3 4.6 CREATE PYTHON MODULES

```
In [6]: import addition
        addition.add(10,20)
        addition.add(30,40)
```

```
        ---------------------------------------------------------------------------

        ModuleNotFoundError                       Traceback (most recent call last)

        <ipython-input-6-1a2204da0625> in <module>()
    ----> 1 import addition
          2 addition.add(10,20)
          3 addition.add(30,40)


        ModuleNotFoundError: No module named 'addition'
```

```
In [7]: "{1} {0}".format(x, "The")
        "{first} {second}".format(first="The", second=x)
```

```
        ---------------------------------------------------------------------------

        NameError                                 Traceback (most recent call last)

        <ipython-input-7-e4ee71e1ad54> in <module>()
    ----> 1 "{1} {0}".format(x, "The")
          2 "{first} {second}".format(first="The", second=x)
```

```
NameError: name 'x' is not defined
```