Functions in Python

System define & user define

➢ Required keyword function

➢ Default parameter function

➢ Variable length parameter function

➢ Function inside function

➢ Closure function

➢ Lambda function

Declaring a function (Positional)

```
function.py - D:/Documents/Python/function.py (3.6.4)
File  Edit  Format  Run  Options  Window  Help

# Declare a function without parameter
def message () :
    print ( "Welcome to Python Hub")
message ()

# Declare a function with parameter
def display ( args) :
    print ( args)
display ( "Good Morning")

# Declare a function with returning a value
def output ( x) :
    return x+1
opt=output ( 10)
print ( opt)
```

```
Python 3.6.4 Shell
File  Edit  Shell  Debug  Options  Window  Help

Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:45)   [MSC v.19(
Type "copyright", "credits" or "license ()  " for more information.
>>>
================= RESTART: D:/Documents/Python/function.py
Welcome to Python Hub
Good Morning
11
>>>
```

Required keyword function

requiredparameterfunction.py - D:/Documents/Python/requiredpar...

File Edit Format Run Options Window Help

```
# Required keyword parameter function
def student ( name,age) :
    print ( "Name: ",name,"\nAge: ",age)
student ( name='Ram', age='15')
```

Python 3.6.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:45)
Type "copyright", "credits" or "license ()  " for more informa
>>>
========= RESTART: D:/Documents/Python/requiredpar
Name:  Ram
Age:  15
```

Default parameter function


```
# Default parameter function
def town ( city='Roorkee',state='Uttarakhand',Blocks=10)  :
    print ( "City: ",city,"\nState: ",state,'\nBlocks: ',Blocks)
town ()
```

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 201
Type "copyright", "credits" or "license ()  " fo
>>>
========= RESTART: D:/Documents/Pytho
City:  Roorkee
State:  Uttarakhand
Blocks:  10
```

Variable length parameter

```
# Variable length parameter
def marks ( *data) :
    print ( data)
marks ( 10,15,12,1,5,3)
```

Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:04:45) [MSC v.1900 32 bit (
Type "copyright", "credits" or "license () " for more information.
>>>
========= RESTART: D:/Documents/Python/requiredparameterfunction.py ===
(10, 15, 12, 1, 5, 3)

```
# Variable length parameter
def marks ( **data) :
    print ( data)
marks ( a=10,b=15,c=12,d=1,e=5,f=3)
```

Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:04:45) [MSC v.1900
Type "copyright", "credits" or "license () " for more information.
>>>
========= RESTART: D:/Documents/Python/requiredparameterfunctio
{ 'a': 10, 'b': 15, 'c': 12, 'd': 1, 'e': 5, 'f': 3}

1. * indicate that a variable can store multiple values
2. ** indicate that a variable can store multiple values with key

Function inside function

```
# Function inside a function
def welcome ( user,password)  :
    print ( 'Welcome: ',user)
    def info ( pwd)  :
        print ( "Your password: ",pwd)
    info ( password)
welcome ( "Rajat",123)
```

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:45)
Type "copyright", "credits" or "license ()  " for more inform
>>>
========= RESTART: D:/Documents/Python/requiredpa
Welcome:  Rajat
Your password:  123
>>>
```

Closure function

If a function have an inner function and return it then it is called closure


```
# Closure function
def course ( a ) :
    print ( 'Course: ',a)
    def branch ( b ) :
        print ( "branch: ",b)
    return branch
result=course ( "B.Tech")
result ( 'CS')
```

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:45)   [MSC v.
Type "copyright", "credits" or "license () " for more information.
>>>
========= RESTART: D:/Documents/Python/requiredparameterfu
Course:  B.Tech
branch:  CS
>>>
```

Lambda function

A function define without name in a single line

requiredparameterfunction.py - D:/Documents

File   Edit   Format   Run   Options   Window

```python
# Lambda function
abc=lambda x,y : x**y
result=abc (7,3)
print ( result)
```

Python 3.6.4 Shell

File   Edit   Shell   Debug   Options   Window   Help

Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:04:45)   [MSC v.1900 32 bi
Type "copyright", "credits" or "license () " for more information.
>>>
========= RESTART: D:/Documents/Python/requiredparameterfunction.py :
343

Program to square each number of list

square_of_digits_list.py - D:/Documents/Python/square

File Edit Format Run Options Window Help

```python
# Square of number of list
lst=[2,3,4,5]
out=[]
for i in lst:
    sqr=i**2
    out.append ( sqr)
print ( out)


# Square using map function
def sqr ( x)  :
    return x**2
result=map ( sqr,lst)
print ( type ( result) )
print ( list ( result) )
```

Python 3.6.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:45)   [MSC v.1900 32 b
Type "copyright", "credits" or "license ()  " for more information.
>>>
=========== RESTART: D:/Documents/Python/square__of__digits__list.py
[4, 9, 16, 25]
<class 'map'>
[4, 9, 16, 25]
>>>
```

Finding greatest no. Out of 3


```python
# Python program to find greatest of three numbers
def max_of_two ( x, y ) :
    if x > y:
        return x
    return y
def max_of_three ( x, y, z) :
    return max_of_two ( x, max_of_two ( y, z) )
print ( max_of_three ( 15, 6,7) )
```

```
Python 3.6.4 Shell
File  Edit  Shell  Debug  Options  Window  Help
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06
Type "copyright", "credits" or "license ()  " for mo
>>>
============ RESTART: D:\Documents\Pytho
15
>>>
```

Sum of all no. Of tuple

```
Function_sum_of_no_of_list.py - D:/Documents/Python/Fur
File  Edit  Format  Run  Options  Window  Help
def sum ( numbers)  :
    total = 0
    for x in numbers:
        total += x
    return total
print ( sum ( ( 8, 2, 3, 0, 7) ) )
```

```
Python 3.6.4 Shell
File  Edit  Shell  Debug  Options  Window  Help
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:45)
Type "copyright", "credits" or "license ()  " for more informa
>>>
========= RESTART: D:/Documents/Python/Function__s
20
>>>
```

Multiply of all no. Of tuple

Function_mul_of_no.py - D:/Documents/Python/Function_mul_of_n

File Edit Format Run Options Window Help

```python
# Multiply of numbers
def multiply ( numbers) :
    total = 1
    for x in numbers:
        total *= x
    return total
print ( multiply ( ( 8, 2, 3) ) )
```

Python 3.6.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06
Type "copyright", "credits" or "license ()  " for mc
>>>
============= RESTART: D:/Documents/Pyth
48
>>>
```

Reverse a string

```
Function_reverse_string.py - D:/Documents/Python/Function_revers

File  Edit  Format  Run  Options  Window  Help

# Reverse a string
def string_ reverse ( str1)  :

    rstr1 = ''
    index = len ( str1)
    while index > 0:
        rstr1 += str1[ index - 1 ]
        index = index - 1
    return rstr1
print ( string_ reverse ( '1234abcd') )
```

```
Python 3.6.4 Shell

File  Edit  Shell  Debug  Options  Window  Help

Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:
Type "copyright", "credits" or "license ()  " for more ir
>>>
========== RESTART: D:/Documents/Python/Func
dcba4321
>>>
```

Factorial of a number

```python
# Factorial of a number
def factorial ( n ) :
    if n == 0:
        return 1
    else:
        return n * factorial ( n-1 )
n=int ( input ( "Input a number to compute the factiorial : ") )
print ( factorial ( n ) )
```

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017,
Type "copyright", "credits" or "license ()  " for m
>>>
============= RESTART: D:/Documents/Pyt
Input a number to compute the factiorial : 5
120
>>>
```

Calculate block & small letters

```
Function_upper_lower_case.py - D:/Documents/Python/Function_upper_lower_case.py (3.6.4)
File  Edit  Format  Run  Options  Window  Help

# Python function to calculate the number of upper case letters and lower case letters.
def string__test ( s )  :
  uc,lc,block__letter,small__letter=0,0,"",""
  for c in s:
    if c.isupper ()  :
      #d["UPPER__CASE"]+=1
      block__letter+=c+","
      uc+=1
    elif c.islower ()  :
      # d["LOWER__CASE"]+=1
      small__letter+=c+","
      lc+=1
    else:
      pass
  print  ( "Original String : ", s)
  print  ( "No. of Upper case characters : ", uc)
  print  ( "No. of Lower case Characters : ", lc)
  print  ( "list of lower case letters: ",small__letter)
  print  ( "list of Upper case letters: ",block__letter)

string__test ( 'The quick Brow Fox')
```

```
Python 3.6.4 Shell
File  Edit  Shell  Debug  Options  Window  Help

Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:
Type "copyright", "credits" or "license ()  " for mor
>>>
========= RESTART: D:/Documents/Python/Fur
Original String :  The quick Brow Fox
No. of Upper case characters :  3
No. of Lower case Characters :  12
list of lower case letters: h,e,q,u,i,c,k,r,o,w,o,x,
list of Upper case letters:  T,B,F,
>>>
```

Reverse a number

```
# Reverse a number
def reverse_num ( num) :
    result=0
    while ( num!=0) :
        rem=num%10
        result=result*10+rem
        num=num//10
    return result
    '''if ( orgnum==result) :
        print ( orgnum, ' is palindrome')
    else:
        print ( orgnum, ' is not palindrome')  '''
orgnum=input ( 'Enter a number: )
orgnum=int ( orgnum)
x=orgnum
print ( reverse_num ( x) )
```

```
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:04:45
Type "copyright", "credits" or "license ()  " for more info
>>>
========== RESTART: D:/Documents/Python/Functio
Enter a number: 123
321
>>> |
```

Create a list of unique no. From a list

```
Function_Unique_list.py - D:/Documents/Python/Function_Unique_list.py (3.6.4)
File  Edit  Format  Run  Options  Window  Help

# Function to returns a new list with unique elements of the first list.
def unique__list ( l ) :
  x = []
  for a in l:
   if a not in x:
    x.append ( a )
  return x


print ( unique__list ( [1,2,3,3,3,3,4,5] ) )
```

```
Python 3.6.4 Shell
File  Edit  Shell  Debug  Options  Window  H

Python 3.6.4  ( v3.6.4:d48ece
Type "copyright", "credits" or '
>>>
============ RESTART: D:
[1, 2, 3, 4, 5]
>>>
```

Create a list of unique no. From a list

```
Function_Unique_list.py - D:/Documents/Python/Function_Unique_list.py (3.6.4)
File  Edit  Format  Run  Options  Window  Help

# Function to returns a new list with unique elements of the first list.
def unique__list ( l ) :
 x = []
 for a in l:
  if a not in x:
    x.append ( a )
 return x


print ( unique__list ( [1,2,3,3,3,3,4,5] )  )
```

```
Python 3.6.4 Shell
File  Edit  Shell  Debug  Options  Window  H

Python 3.6.4  ( v3.6.4:d48ece
Type "copyright", "credits" or '
>>>
============ RESTART: D:
[1, 2, 3, 4, 5]
>>>
```

Check whether a number is prime

```python
# Function prime number
def test_prime (n) :
    if ( n==1) :
        return False
    elif ( n==2) :
        return True;
    else:
        for x in range ( 2,n) :
            if ( n % x==0) :
                return False
        return True
print ( test_prime ( 5) )
```

```
Python 3.6.4 Shell
File  Edit  Shell  Debug  Options  Window  Help
Python 3.6.4  ( v3.6.4:d48eceb, Dec 19 2017, 06:0
Type "copyright", "credits" or "license ()  " for more
>>>
=========== RESTART: D:/Documents/Python/F
True
>>>
```