**Lab4**

*Functions and Modules*

https://www.tutorialspoint.com/python

http://marcuscode.com/lang/python/functions

**SECTION 1: FUNCSIONS**

1. Defining a function

def printme( str ):

"This prints a passed string into this function"

print (str)

return

<<Try to understand the function elements>>

Calling function

printme("This is first call")

printme("Again second")



1. Pass by reference

# Function definition is here

def changeme( mylist ):

"This changes a passed list into this function"

print ("Values inside the function: ", mylist)

mylist[2]=50

print ("Values inside the function after change: ", mylist)

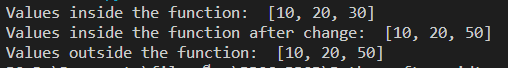
return

# Now you can call changeme function

mylist = [10,20,30]

changeme( mylist )

print ("Values outside the function: ", mylist)



One more example where argument is being passed by reference and the reference is being overwritten inside the called function.

# Function definition is here

def changeme( mylist ):

"This changes a passed list into this function"

# This would assign new reference in mylist

mylist = [1,2,3,4]

print ("Values inside the function: ", mylist)

return

# Now you can call changeme function

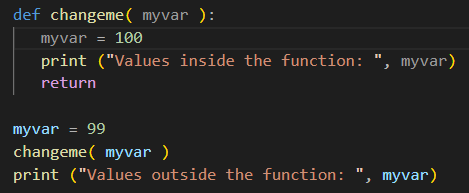
mylist = [10,20,30]

changeme( mylist )

print ("Values outside the function: ", mylist)



**Exercise:** Let’s try to pass on of the primitive datatype (e.g. Integer, Float, String, Boolean) and see that it is passed by reference or pass by value





1. Arguments

Required arguments

# Function definition is here

def printme( str ):

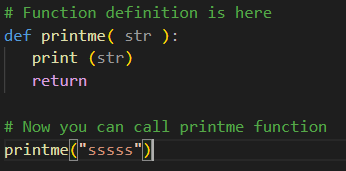
"This prints a passed string into this function"

print (str)

return

# Now you can call printme function

printme()





Keyword arguments

# Function definition is here

def printme( str ):

"This prints a passed string into this function"

print (str)

return

# Now you can call printme function

printme( str = "My string")



# Function definition is here

def printinfo( name, age ):

"This prints a passed info into this function"

print ("Name: ", name)

print ("Age ", age)

return

# Now you can call printinfo function

printinfo( age = 50, name = "miki" )



Default arguments

# Function definition is here

def printinfo( name, age = 35 ):

"This prints a passed info into this function"

print ("Name: ", name)

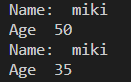
print ("Age ", age)

return

# Now you can call printinfo function

printinfo( age = 50, name = "miki" )

printinfo( name = "miki" )

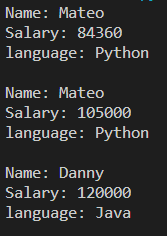


Text

Description automatically generated with medium confidence

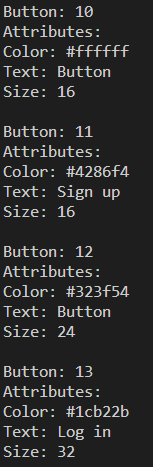
Text

Description automatically generated with low confidence



Text

Description automatically generated



Variable-length arguments

# Function definition is here

def printinfo( arg1, \*vartuple ):

"This prints a variable passed arguments"

print ("Output is: ")

print (arg1)

for var in vartuple:

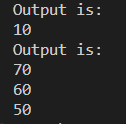
print (var)

return

# Now you can call printinfo function

printinfo( 10 )

printinfo( 70, 60, 50 )



<<what is the value of arg1 in printinfo(70, 60, 50)>>

70

<<what is the value of \*vartuple in printinfo(70, 60, 50)>>

(60, 50)

1. Return statement

# Function definition is here

def sum( arg1, arg2 ):

# Add both the parameters and return them."

total = arg1 + arg2

print ("Inside the function : ", total)

return total

# Now you can call sum function

total = sum( 10, 20 )

print ("Outside the function : ", total )



1. Lambda function

# Function definition is here

sum = lambda arg1, arg2: arg1 + arg2

# Now you can call sum as a function

print ("Value of total : ", sum( 10, 20 ))

print ("Value of total : ", sum( 20, 20 ))



A picture containing text

Description automatically generated



Calendar

Description automatically generated



Built-in functions for lambda: filter() and map()

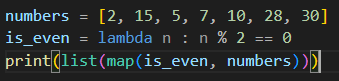
Calendar

Description automatically generated



True or False

is\_even = lambda n : n % 2 == 0





Using Lambda with map (changing the sequence with new value)

Calendar

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**Exercise**: Describe the different between filter and map

Filter

Filter function takes 2 arguments, a function and a list. It returns a list of values that the given function returns true upon

Map

Map function takes 2 arguments, a function and a list. It returns a list of values that was passed through the given function

1. Global and local variables

total = 0 # This is global variable.

# Function definition is here

def sum( arg1, arg2 ):

# Add both the parameters and return them."

total = arg1 + arg2; # Here total is local variable.

print ("Inside the function local total : ", total)

return total

# Now you can call sum function

sum( 10, 20 )

print ("Outside the function global total : ", total )



1. Example

Chart, scatter chart

Description automatically generated





Graphical user interface, text, application

Description automatically generated





**SECTION 2: MODULES**

1. Create a file name "support.py" and write the following code

def print\_func( par ):

print("Hello : ", par)

return

Note: create a new file using VScode

Test the module

# Import module support

import support

# Now you can call defined function that module as follows

support.print\_func("Zara")

<<fill your result>>

The from...import Statement

Import specific function, create a file name 'fb.py' with the following code

# Fibonacci numbers module

def fib(n): # return Fibonacci series up to n

result = []

a, b = 0, 1

while b < n:

result.append(b)

a, b = b, a + b

return result

>>> from fb import fib

>>> fib(100)

<<fill your result>>

1. Variables and Scope

Money = 2000

def AddMoney():

# Uncomment the following line to fix the code:

# global Money

Money = Money + 1

print (Money)

AddMoney()

print (Money)

<<fill your result>>

Now uncomment the line "global Money"

<<fill your result>>

1. See built-in modules

# Import built-in module math

import math

content = dir(math)

print (content)

<<fill your result>>

# Import built-in module math

import fb

content = dir(fb)

print (content)

<<fill your result>>

Compare to the previous result

1. Locals and Globals

In your python shell

money = 100

def fib(n): # return Fibonacci series up to n

result = []

a, b = 0, 1

print(locals())

print(globals())

fib(money)

<<fill your result>>

**SECTION 3: I/O**

1. Open and close file

# Open a file

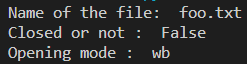
fo = open("foo.txt", "wb")

print ("Name of the file: ", fo.name)

print ("Closed or not : ", fo.closed)

print ("Opening mode : ", fo.mode)

fo.close()



1. Write a file

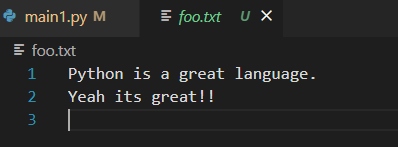
# Open a file

fo = open("foo.txt", "w")

fo.write( "Python is a great language.\nYeah its great!!\n")

# Close opend file

fo.close()



1. Read a file

# Open a file

fo = open("foo.txt", "r+")

str = fo.read(10)

print ("Read String is : ", str)

# Close opened file

fo.close()



**Exercise:** Try all the mode to open the file. Use your own example to explain the different of each mode. You must display the result with explanation.

<<fill your result>>

<<fill your answer>>