

LAB – 1

PYTHON BASIC PRACTICE – I

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1. Assigning Values to Variables

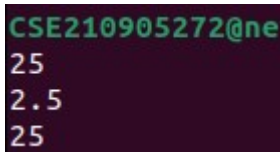
```
counter = 100 # An integer assignment
miles = 1000.0 # A floating point
name = "John" # A string
print (counter)
print (miles)
print (name)
```

2. Multiple Assignment

```
a=b=c=1
a, b, c = 1, 2, "john"
```

3. Python Numbers

```
a = 5 # integer assignment
b= 4.56 #floating point assignment
#mathematical operations with scalar variables
print (5*a)
print (a/2)
print(a**2)
```



```
CSE210905272@ne
25
2.5
25
```

4. NumPy

```
str = 'Hello World!'
print (str) # Prints complete string
print (str[0]) # Prints first character of the string
print (str[2:5]) # Prints characters starting from 3rd to 5th
print (str[2:]) # Prints string starting from 3rd character
print (str * 2) # Prints string two times
print (str + "TEST") # Prints concatenated string
```

```

CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 e1.py
100
1000.0
John
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 e2.py
Hello World!
H
llo
llo World!
Hello World!Hello World!
Hello World!TEST

```

5. Updating a string

```

var1 = 'Hello World!'
print ("Updated String :", var1[:6] + 'Python')

```

6. String formatting operator

```

print( "My name is %s and weight is %d kg!" % ('Satwik', 80))

```

```

$ /bin/python3 /home/CSE210905272/DistributedSystems/Lab1/sample/e3.py
Updated String : Hello Python
My name is Satwik and weight is 80 kg!

```

7. Built-in String methods

```

str = "this is string example...wow!!!";
print (str.capitalize())

```

```

str.count('s')

```

```

str.find('example')

```

```

print (str.lower())

```

```

print (str.replace("is", "was"))

```

```

print (str.swapcase())

```

```

print (str.title())

```

```

CSE210905272@networklab:~/Distribute
This is string example...wow!!!
this is string example...wow!!!
thwas was string example...wow!!!
THIS IS STRING EXAMPLE...WOW!!!
This Is String Example...Wow!!!

```

8. Python list

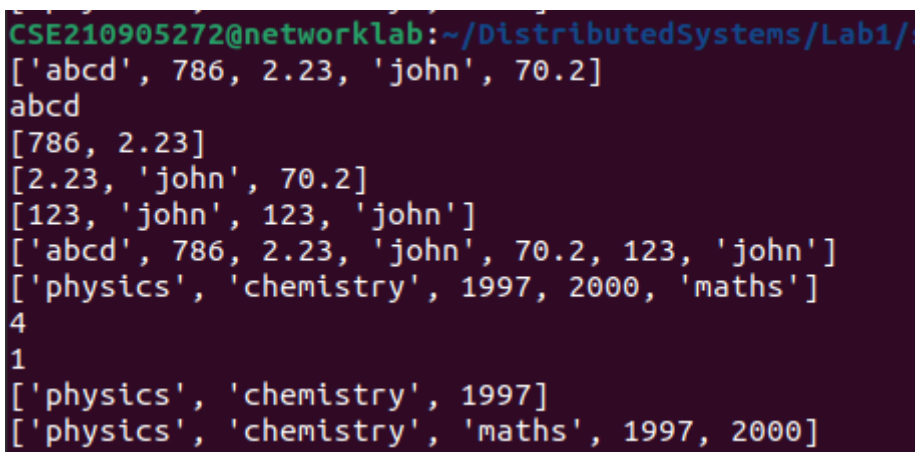
```
list = [ 'abcd', 786 , 2.23, 'john', 70.2 ]
tinylist = [123, 'john']
print (list) # Prints complete list
print (list[0]) # Prints first element of the list
print (list[1:3]) # Prints elements starting from 2nd till 3rd
print (list[2:]) # Prints elements starting from 3rd element
print (tinylist * 2) # Prints list two times
print (list + tinylist) # Prints concatenated lists
```

```
list = ['physics', 'chemistry', 1997, 2000]
list.append('maths')
print(list)
```

```
del list[2]
```

```
print(len(list))
print(list.count('physics'))
```

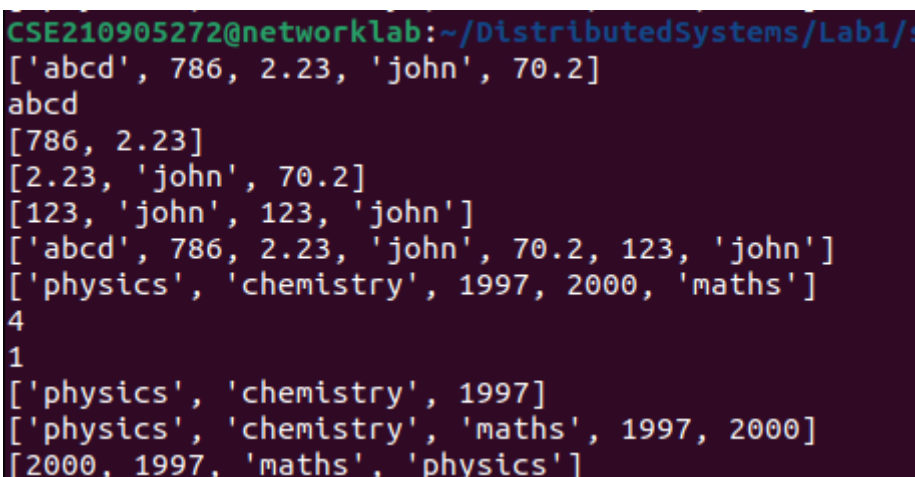
```
#will insert an item in the specified index
list = ['physics', 'chemistry', 1997, 2000];
list.insert (2, 'maths')
print(list)
```

A terminal window with a dark background and light-colored text. The prompt is 'CSE210905272@networklab:~/DistributedSystems/Lab1/'. The output shows the execution of the first set of Python code: the list ['abcd', 786, 2.23, 'john', 70.2] is printed, followed by slicing operations resulting in 'abcd', [786, 2.23], [2.23, 'john', 70.2], and [123, 'john', 123, 'john']. Then, the list is concatenated with tinylist to produce ['abcd', 786, 2.23, 'john', 70.2, 123, 'john']. Next, 'maths' is appended to ['physics', 'chemistry', 1997, 2000] to get ['physics', 'chemistry', 1997, 2000, 'maths']. The length of the list is printed as 5, and the count of 'physics' is printed as 1. Finally, 'maths' is inserted at index 2, resulting in ['physics', 'chemistry', 'maths', 1997, 2000].

```
CSE210905272@networklab:~/DistributedSystems/Lab1/
['abcd', 786, 2.23, 'john', 70.2]
abcd
[786, 2.23]
[2.23, 'john', 70.2]
[123, 'john', 123, 'john']
['abcd', 786, 2.23, 'john', 70.2, 123, 'john']
['physics', 'chemistry', 1997, 2000, 'maths']
5
1
['physics', 'chemistry', 1997]
['physics', 'chemistry', 'maths', 1997, 2000]
```

```
list.remove('chemistry') #will remove the item specified
```

```
list.reverse() #will reverse the objects of the list in place.
print(list)
```

A terminal window with a dark background and light-colored text. The prompt is 'CSE210905272@networklab:~/DistributedSystems/Lab1/'. The output shows the execution of the second set of Python code: the same list operations as before are performed, but after printing the list ['physics', 'chemistry', 'maths', 1997, 2000], the reverse() method is called, and the resulting reversed list is printed: [2000, 1997, 'maths', 'physics', 'chemistry'].

```
CSE210905272@networklab:~/DistributedSystems/Lab1/
['abcd', 786, 2.23, 'john', 70.2]
abcd
[786, 2.23]
[2.23, 'john', 70.2]
[123, 'john', 123, 'john']
['abcd', 786, 2.23, 'john', 70.2, 123, 'john']
['physics', 'chemistry', 1997, 2000, 'maths']
5
1
['physics', 'chemistry', 1997]
['physics', 'chemistry', 'maths', 1997, 2000]
[2000, 1997, 'maths', 'physics', 'chemistry']
```

Python TUPLE

Tuples are lists that cannot be edited

```
tuple = ( 'abcd', 786 , 2.23, 'john', 70.2 )  
list = [ 'abcd', 786 , 2.23, 'john', 70.2 ]  
tuple[2] = 1000 # Invalid syntax with tuple
```

```
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 e6.py  
Traceback (most recent call last):  
  File "/home/CSE210905272/DistributedSystems/Lab1/sample/e6.py", line 3,  
duple>  
    tuple[2] = 1000 # Invalid syntax with tuple  
TypeError: 'tuple' object does not support item assignment
```

EXAMPLE 1:

```
num=float(input('Enter a number:'))  
if num>0:  
    print('pos number')  
elif num==0:  
    print('zero')  
else:  
    print('Neg number')
```

```
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg1.py  
Enter a number:3  
pos number  
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg1.py  
Enter a number:-1  
Neg number  
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg1.py  
Enter a number:0  
zero
```

EXAMPLE 2:

```
x=float(input('Enter a number:'))  
if x<10:  
    print('smaller')  
if x>20:  
    print('bigger')  
print('Finished')
```

```
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg2.py  
Enter a number:11  
Finished  
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg2.py  
Enter a number:9  
smaller  
Finished  
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg2.py  
Enter a number:21  
bigger  
Finished
```

3

```
for i in range(5):
    print(i)
    if i>2:
        print('Bigger than 2')
        print('Done with i',i)
```

```
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg3.py
0
1
2
3
Bigger than 2
Done with i 3
4
Bigger than 2
Done with i 4
```

4

```
x=int(input('Enter a number:'))
for i in range(1,x+1):
    if x%i ==0:
        print(i)
```

```
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg4.py
Enter a number:10
1
2
5
10
```

5

```
from math import *
x= [9, 41, 12, 3, 74, 15]
Largest=-inf
for i in x:
    if i>Largest:
        Largest=i
print(Largest)
```

```
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ python3 eg5.py
9
41
74
```

6

```
from math import *
x= [9, 41, 12, 3, 74, 15]
smallest=inf
for i in x:
    if i<smallest:
        smallest=i
print(smallest)
```

```
CSE210905272@networklab:~
9
9
9
3
3
3
```

7

```
x= [9, 41, 12, 3, 74, 15]
count=sum=avg=0
for i in x:
count=count+1
sum=sum+i
avg=sum/count
print(count)
print(sum)
print(avg)
```

```
CSE210905272@networklab:~/DistributedSystems/Lab1/sample$ pyth
6
154
25.666666666666668
```

8

```
x= [9, 41, 12, 3, 74, 15]
for i in x:
if i>20:
print (i)
CSE210905272@networklab:~/Dis
41
74
```

9

```
sample > eg9.py > ...
1 x= [9, 41, 12, 3, 74, 15]
2 res=[]
3 for i in x:
4     if i>20:
5         res.append(i)
6 print(res)
CSE210905272@netwo
CSE210905272@networklab:
[41, 74]
CSE210905272@networklab:
```

10


```

1 import numpy as np
2 x= [9, 41, 12, 3, 74, 15]
3 y=np.zeros(len(x))
4 for i in range(len(x)):
5     if x[i]>20:
6         y[i]=x[i]
7 print(y)

```

CSE210905272@networklab:~/Distribute
[0. 41. 0. 0. 74. 0.]
CSE210905272@networklab:~/Distribute

11

```

sample > eg11.py > ...
1 price = 100
2 if price > 100:
3     print("price is greater than 100")
4 elif price == 100:
5     print("price is 100")
6 elif price < 100:
7     print("price is less than 100")

```

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price is 100
CSE210905272@netw

12

```

sample > eg12.py > ...
1 # initialize the variable
2 i=1
3 n=5
4 # while loop from i = 1 to 5
5 while i <= n:
6     print(i)
7     i=i+1

```

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1
2
3
4
5
CSE210905272@networkla

13

```

sample > eg13.py > ...
1 total = 0
2 number = int(input('Enter a number: '))
3 # add numbers until number is zero
4 while number != 0:
5     total += number # total = total + number
6 # take integer input again
7     number = int(input('Enter a number: '))
8 print('total =', total)

```

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Enter a number: 5
Enter a number: 6
Enter a number: 7
Enter a number: 8
Enter a number: 9
Enter a number: 0
total = 35
CSE210905272@network

Q1) Write a program to find the area of rectangle. Take input from user.

```
x=int(input("Enter a: "))
y=int(input("Enter b: "))
x=x*y
print('Area: ', x)
```

```
q1.py > ...
1 x=int(input("Enter a: "))
2 y=int(input("Enter b: "))
3 x=x*y
4 print('Area: ', x)

CSE210905272@networklab:~/DistributedSystems/Lab1$ python3 q1.py
Enter a: 3
Enter b: 4
Area: 12
CSE210905272@networklab:~/DistributedSystems/Lab1$
```

Q2) Write a program to swap

```
x=3
y=4
print('x: ',x , 'y: ',y)
temp=x
x=y
y=temp
print(' SWap x: ',x , 'y: ',y)
```

```
q2.py > ...
1 x,y=3,4
2 print('x: ',x , 'y: ',y)
3 temp=x
4 x=y
5 y=temp
6 print(' SWap x: ',x , 'y: ',y)

CSE210905272@networklab:~
x: 3 y: 4
SWap x: 4 y: 3
CSE210905272@networklab:~
```

.

Q3) Write a program to find whether a number is even or odd.

```
q3.py > ...
1 x=int(input("Enter a number:"))
2 if x%2==0:
3     print("Even.")
4 else:
5     print('odd')

CSE210905272@networklab:~/t
Enter a number:3
odd
CSE210905272@networklab:~/t
Enter a number:2
Even.
CSE210905272@networklab:~/t
```

.

Q4) Write a program to check the largest among the given three numbers.

```
x=int(input(' Enter num: '))
```



```
y=int(input(' Enter num: '))
z=int(input(' Enter num: '))
```

```
if x>=y:
    if(x>=z):
        print(x, 'is the largest')
    else:
        print(z, 'is the largest')
elif y>=x:
    if(y>=z):
        print(y, 'is the largest')
    else:
        print(z, 'is the largest')
else:
    print(z, 'is the largest')
```

```
q4.py > ...
1  x=int(input(' Enter num: '))
2  y=int(input(' Enter num: '))
3  z=int(input(' Enter num: '))
4
5  if x>=y:
6      if(x>=z):
7          print(x, 'is the largest')
8      else:
9          print(z, 'is the largest')
10 elif y>=x:
11     if(y>=z):
12         print(y, 'is the largest')
13     else:
14         print(z, 'is the largest')
15 else:
16     print(z, 'is the largest')
```

```
Enter num: 1
Enter num: 9
CSE210905272@networklab:~/
Enter num: 5
Enter num: 1
Enter num: 9
9 is the largest
CSE210905272@networklab:~/
```

.

5. Write a program to demonstrate List functions and operations.

```
list = [ 'MIT', 12345 , 3.14, 'TTT', 69.2, 'MIT', 'CAT', 2323]
tinylist = [123, 'BALL']
print (list) # Prints complete list
print (list[0]) # Prints first element of the list
print (list[1:3]) # Prints elements starting from 2nd till 3rd
print (list[2:]) # Prints elements starting from 3rd element
print (tinylist * 2) # Prints list two times
print (list + tinylist) # Prints concatenated list
list.append('maths')
print(list)
del list[2]
print(len(list))
```

```
print('Number of times MIT occurs:', list.count('MIT'))
list.insert(2, 'maths')
print(list)
```

```
q5.py > ...
1 list = ['MIT', 12345, 3.14, 'TTT', 69.2, 'MIT', 'CAT', 2323]
2 tinylist = [123, 'BALL']
3 print(list) # Prints complete list
4 print(list[0]) # Prints first element of the list
5 print(list[1:3]) # Prints elements starting from 2nd till 3rd
6 print(list[2:]) # Prints elements starting from 3rd element
7 print(tinylist * 2) # Prints list two times
8 print(list + tinylist) # Prints concatenated list
9 list.append('maths')
10 print(list)
11 del list[2]
12 print(len(list))
13 print('Number of times MIT occurs:', list.count('MIT'))
14 list.insert(2, 'maths')
15 print(list)
```

```
CSE210905272@networklab: ~/DistributedSystems/Lab1
CSE210905272@networklab:~/DistributedSystems/Lab1$ python3 q5.py
['MIT', 12345, 3.14, 'TTT', 69.2, 'MIT', 'CAT', 2323]
MIT
[12345, 3.14]
[3.14, 'TTT', 69.2, 'MIT', 'CAT', 2323]
[123, 'BALL', 123, 'BALL']
['MIT', 12345, 3.14, 'TTT', 69.2, 'MIT', 'CAT', 2323, 123, 'BALL']
['MIT', 12345, 3.14, 'TTT', 69.2, 'MIT', 'CAT', 2323, 'maths']
8
Number of time MIT occurs: 2
['MIT', 12345, 'maths', 'TTT', 69.2, 'MIT', 'CAT', 2323, 'maths']
CSE210905272@networklab:~/DistributedSystems/Lab1$
```

6) Consider the tuple(1,3,5,7,9,2,4,6,8,10). Write a program to print half its values in one line and the other half in the next line.

```
q6.py > ...
1 tuple=(1,2,3,4,5,6,7,8,10)
2
3 x=len(tuple)//2
4
5 print(tuple[:x])
6 print(tuple[x:])
```

```
CSE210905272@networklab:
(1, 2, 3, 4)
(5, 6, 7, 8, 10)
CSE210905272@networklab:
```

7) Consider the tuple (12, 7, 38, 56, 78). Write a program to print another tuple whose values are even number in the given tuple.

```
q7.py > ...
1 tuple=(12, 7, 38, 56, 78)
2
3 tri=[x for x in tuple if x%2==0]
4 print(tri)
```

```
CSE210905272@networklab:
[12, 38, 56, 78]
CSE210905272@networklab:
```

8) Write a Python program to print negative Numbers in a List using for loop. Eg. [11, -21, 0, 45, 66, -93].

```
q8.py > ...
1 y=[11, -21, 0, 45, 66, -93]
2
3 for x in y:
4     if x<0:
5         print(x )
6
```

```
CSE210905272@networklab:
-21
-93
CSE210905272@networklab:
```

9) Write a Python program to count positive and negative numbers in a List.

```
y=[11, -21, 0, 45, 66, -93]
```

```
pos,neg=0,0
```

```
for x in y:
if x<0:
neg+=1
else:
pos+=1
print('Positive numbers: ', pos, 'Negative numbers: ', neg)
```

```
q9.py > ...
1 y=[11, -21, 0, 45, 66, -93]
2
3 pos,neg=0,0
4
5 for x in y:
6     if x<0:
7         neg+=1
8     else:
9         pos+=1
10 print('Positive numbers: ', pos, 'Negative numbers: ', neg)
```

```
CSE210905272@networklab: ~/Distribu
CSE210905272@networklab:~/DistributedSystem
Positive numbers: 4 Negative numbers: 2
CSE210905272@networklab:~/DistributedSystem
```

10) Write a Python program to remove all even elements from a list.

```
q10.py > ...
1 y=[11, -21, 0, 45, 66, -93]
2 print(y)
3 for x in y:
4     if x%2==0:
5         y.remove(x)
6 print('LIST:', y)
```

```
CSE210905272@networklab: ~/DistributedSystem
CSE210905272@networklab:~/DistributedSystems/Lab1$
[11, -21, 0, 45, 66, -93]
LIST: [11, -21, 45, -93]
CSE210905272@networklab:~/DistributedSystems/Lab1$
```