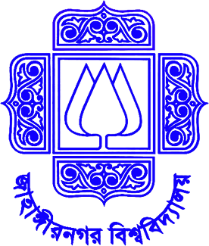
Institute of Information Technology

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Lab Manual

Course Code: ICT-4202

Course Title: Digital Image Processing Lab

**Lab No.: 1**

**Lab Title: INTRODUCTION TO PYTHON**

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**Lab Title: INTRODUCTION TO PYTHON**

OBJECTIVE:

To introduce students with python programming language.

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**Lab Contents:**

1. Comment
2. print()
3. Operators
4. i. + plus
5. ii. - minus
6. iii. \* multiply
7. iv. \*\* power
8. v. / divide
9. vi. // divide and floor
10. vii. % modulus
11. Operators
12. + plus
13. - minus
14. \* multiply
15. \*\* power
16. divide
17. // divide and floor
18. % modulus
19. Variables
20. Strings
21. LISTS
22. Indentation
23. Boolean operations
24. Branching
25. Looping
26. Functions

**Theory with Hands on Practice:**

1. Comment

# is used for commenting.

Example: # This is a comment.

1. Whatever you put inside parentheses of print function will be your output

Example : print (5); print (10); print (12+6);

1. Operators

print(5+6)

print(5\*6)

print(2\*\*4)

print(4/3)

print(7//3)

print(4%2)

1. Variables

x=4

print(type(x))

print(4)

x,y,z=3.1417, 67,5

print(x+y)

print(type(x))

z=True #First letter should be zero in declaring v

print(z)

print(type(z))

t=str(56)

print(t)

print(type(t))

1. Strings

a='py'

b='charm'

print (a + b) # + will join the two strings

print (a,b)

print (a\*5)

#print (a + 5) # Type Error: must be str, not int

print (a + str (5))

t = """Lorem ipsum dolor sit amet,

consectetur adipiscing elit,

sed do eiusmod tempor incididunt

ut labore et dolore magna aliqua."""

print(t)

1. Lists

x = [1,2,3,4]

note: list are not arrays because arrays are of single data type however list may contain variables of different data types.

x=int (input (<Enter a number=) # input ( ) function always input string,

# int ( ) function is used to convert string to int

y = 3.14 z = "HELLO"

li = [x, y, z, 4]

print(li)

List indexes

# From left to right: 0 -> 1 -> 2

# From right to left: -1 -> -2 -> -3

print (li [2] [-4])

slicing #list [start: end: optional step size] ; start is inclusive and end is exclusive

LISTS

x = [1,2,3,4]

note: list are not arrays because arrays are of single data type however list may

contain variables of different data types.

x=int (input (<Enter a number=) # input ( ) function always input string,

# int ( ) function is used to convert string to int

print (li [1:3])

print (li [0:4:2])

print (li [:])

print (li [0:])

print (li [1:3])

print (li [0:4:2])

print (li [:])

print (li [0:])

print (li [:3])

print (li [2] [1:4])

#Deleting something from a list del (li [2])

copy

w = [1, 2, 3, 4]

x = w # The assignment copies the reference to the original list

y = w [:] # Slicing creates a new list

x [0] = 6

y [1] = 9

print(w)

1. Indentation

Whitespace is important in Python. Actually, whitespace at the beginning of the line is important. This is called indentation. Leading whitespace (spaces and tabs) at the beginning of the logical line is used to determine the indentation level of the logical line, which in turn is used to determine the grouping of statements.

Example:

x=2

if x==10:

print ("this is inside if block")

print ("this is also inside if block")

print("this will print always")

1. Boolean operations

< (less than)

(greater than)

<= (less than or equal to)

>= (greater than or equal to)

== (equal to)

! = (not equal to)

not (boolean NOT) if not x:

and (boolean AND) if x==2 and y>4:

or (boolean OR)

Page 3 of 9

print (li [:3])

print (li [2] [1:4])

#Deleting something from a list

del (li [2])

copy

w = [1, 2, 3, 4]

x = w # The assignment copies the reference to the original list

y = w [:] # Slicing creates a new list

x [0] = 6

y [1] = 9

print(w)

7. Indentation

Whitespace is important in Python. Actually, whitespace at the beginning of

the line is important. This is called indentation. Leading whitespace (spaces

and tabs) at the beginning of the logical line is used to determine the

indentation level of the logical line, which in turn is used to determine the

grouping of statements.

Try this.

x=2

if x==10:

print ("this is inside if block")

print ("this is also inside if block")

print("this will print always")

8.

1. The IF statement

number = 23

if number == 24:

print ('number is equal to 24')

elif number<24:

print (Number is less than 24)

else:

print (Number is higher than 24)

1. The while statements

number = 23

while number<50:

print(number)

number+=1

else:

print ("wow there is an else for while statement as well")

1. The for statement

#Indentation

for i in range (10):

if i==6:

break

print(i)

for i in range (3, 10):

print(i)

if i==6:

continue

for i in range (1, 10, 3):

print(i)

1. Functions

def print\_max (a, b=0):

if a > b:

print (a, 'is maximum')

elif a == b:

print (a, 'is equal to', b)

else:

print (b, 'is maximum')1

print\_max (3, 4)

x = 5

y = 7

print\_max (x, y)

Keyword arguments

def func (a, b=5, c=10):

print ('a is', a, 'and b is', b, 'and c is', c)

func (3, 7)

func (25, c=24)

func (c=50, a=100)

Return

def max (x, y):

if x > y:

return x

else:

return y

m=max (3,5)

print(m)

**Tasks:**

**Task – 1:**

x = [[1, 2, 3, 4, 5], [21, 22, 23, 24, 25], [31, 32, 33, 34, 35]

1. Write python code using python indexing and slicing for the following output. Use only one print statement for each:
2. [31, 32, 33, 34, 35]
3. 23
4. [22,23]
5. [1, 3, 5]
6. Declare y = [0, 0, 0], now using for loop write average of first list in list ‘x’ on first index of list y and so on. The print(y) should give the output: [3.0, 23.0, 33.0]

**Task – 2:**

x = [1, 3, 5, 6, 7, 8, 6, 1, 2, 3]

y = [0, 0, 0, 0, 0, 0, 0, 0]

1. Write python code using while loop that write average of first three items on first index of y and so on. The print(y) should give the following output

Output : [3.0, 4.666666666666667, 6.0, 7.0, 7.0, 5.0, 3.0, 2.0]

1. Define a function that takes list length as argument and returns the average. Then calculate the average of x and y.