GOVERNMENT POLYTECHNIC

GULZARBAGH, PATNA - 800 007

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CLASS ROLL No.: ....46/CSE/21.....

BOARD ROLL No. :....111181821046.... GROUP ....A.....

SESSION :....2021-24.... YEAR/SEMESTER ....4th.....

SUBJECT :....Python Programming (Lab) - 2018402.....

Professor's Signature

16/08/2023

Name	Harsh Deep	Year	2021-24
Subject	Python Programming (LAB)	Class	
Semester	4th -2018408	Roll No.	46/CSE/21

INDEX

S. No.	Experiment Description	Experiment Date	Submission Date	Remarks / Signature
01	Write a program to demonstrate basic data type in python.			
02.	Write a program to compute distance between two points taking input from the user (pythogoream theorem).			
03.	Write a python program using for loop, write a program that prints out the decimal equivalent of $1+1/2+1/3 \ldots 1/n$.			
04.	Write a python program to find first n prime number.			

16/05/2023

INDEX

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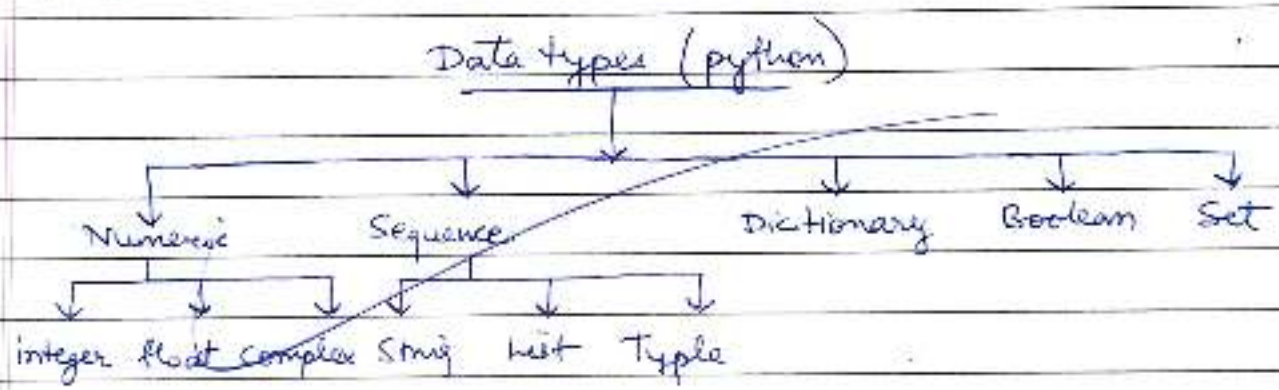
05.	Write a program using a for loop that loops over a sequence.			Jayalaxmi 16/05/2022

Unit → 01

- **Aim** : Write a program to demonstrate basic data type in python.

- **Theory**

→ Data types are classification of data items, It represents the kind of value that tells what operations can be performed on a particular data.



* **Numeric**

→ In python, numeric data type represents the data which has numeric value. Numeric can be integer, floating number or even the complex numbers.

⇒ integers : 1, 2, 4, 8, 243, 10402, etc

⇒ Float : 1.4, 7.29, 8.001, 70.4001, etc

⇒ Complex number : $-2+3i$, $(x+iy)$ etc.

- **Program**

→
```
a = 5
print("Type of a : ", type(a))
b = 5.0
print("\n Type of b : ", type(b))
c = 2+4j
print("\n Type of c : ", type(c))
```

- **Output :**

→
```
Type of a : <class 'int'>
Type of b : <class 'float'>
Type of c : <class 'complex'>
```

* **Sequence**

→ In python, sequence is the ordered collection of similar or different data types.

(a) ⇒ **String** : A string is a sequence of character put in a single quote, double quote, or triple quote.

Ex : a = "Welcome to GP Patna - 7"
print (type(a))

Output :

```
<class 'str'>
```

(b) ⇒ List : List is a collection of different value or different types of items.

The items in the list are separated with the comma (,) and enclosed by square brackets [].

Ex : List = ["Welcome", "to", "GP", "Patna", "7"]
print (List)
print (List[0])
print (List[3])
print (List[-1])

Output :

```
["Welcome", "to", "GP", "Patna", "7"]
Welcome
Gaya
7
```

(c) ⇒ Tuple : Just like list, tuple is also an ordered collection of python objects.

In python ty tuples are written with round brackets

Ex:

```
Tuple = (0, 1, 2, "Python")
print (Tuple)
print (Tuple[1])
print (Tuple[3])
```

Output:

```
(0, 1, 2, "Python")
1
Python
```

(d) ⇒ **Boolean** : Data type with one of the built in value, True or False. It is denoted by the class bool.

Ex:

```
print (type (True))
print (type (False))
print (type (true))
```

Output:

```
<class 'bool'>
<class 'bool'>
Error, name 'true' is not defined
```

(e) **Set** : In python, set is an unordered collection of datatype that is iterable, mutable and has no duplicate elements.

Ex :

```
Set 1 = Set ("GPPATNA")
print (Set1).
```

Output :

{'G', 'P', 'A', 'T', 'N'}

(f) **Dictionary** : Dictionary in python is an unordered collection of data values, used to store data values like a map, which unlike other data types, that hold only single value as an element, Dictionary hold Key.

Ex :

```
Dict = {1:'G', 2:'P', 3:'GePatna'}
print (Dict)
```

Output :

{1:'G', 2:'P', 3:'Patna'}

— X —

Unit - 02

- **Aim** : Write a program to compute distance between two points taking input from the user (pythagorean Theorm)

- **Theory**

→ This python program calculates distance between two points or co-ordinates given by user using distance Formula.

→ This program use following formula for distance between two points :

$$\text{Distance Formula} = \left((x_2 - x_1)^2 + (y_2 - y_1)^2 \right)^{1/2}$$

where, (x_1, y_1) are coordenates of the First point and
(x_2, y_2) are co-ordinates of the Second point.

- **Program**

→
```
# Python program to calculate Distance
# Reading co-ordinates
```

```
x1 = Float (input ('Enter x1 : '))
y1 = Float (input ('Enter y1 : '))
x2 = Float (input ('Enter x2 : '))
y2 = Float (input ('Enter y2 : '))
# Calculating distance

Sd = ((x2-x1)**2 + (y2-y1)**2)** 0.5
# display result
  print ('Distance = ', sd)
```

Output :

```
Enter x1 : 4
Enter y1 : 2
Enter x2 : 8
Enter y2 : 5
Distance = 5.0
```

—x—

Unit - 03

- **Aim :** Write a python program using for loop, write a program that prints out the decimal equivalent of $1 + 1/2 + 1/3 + \ldots + 1/n$.

- **Program**

→
```
# Python program to find the sum
of series

def Sum 0.0 :
    i = 1
    S = 0.0
    for i in range (1, n+1) :
        S = S+1/i ;
    return S ;
# Driver Code
n=5
print ("Sum is", round (sum (n), 6))
```

Output :

Sum is 2.283333

—X—

Unit - 04

- **Aim :** Write a python program to find first n prime numbers.

- **Algorithm**

Step 1 : Read the value of n

Step 2 : For num in range (0, n+1) perform the following step 3.

Step 3 : if num % i is 0, then break else and print the value of num.

- **Program**

→
```
n = int(input("Enter the value of upper limit : "))
# To display the prime numbers
print(" prime numbers are ");
for num in range(0, n+1):
# Prime number is a whole number greater than 1 that cannot be exactly divided by any whole numer other than itself and 1.
```

```
if num > 1 :
for (Num % 1) == 0
    break.
else :
    print (num)
```

Sample Output :

```
Enter the upper limit : 20

Prime numbers are : 2
                    3
                    5
                    7
                    11
                    13
                    17
                    19
```

Part - 02

- Aim : Write a program to demonstrate list and tuple in python

- Algorithm

Step 1 : From the given list having numbers and its cube in each tuple.

Step 2 : Creating list

list1 = [1, 2, 5, 6]

Step 3 : Using list comprehensions to iterate each values in list and Create a tuple as specified

res = [(val: pow(val : 3)) for val in list)]

Step 4 : print the result

print (res)

Output :

[(1,1), (2,8), (5, 125), (6, 216)]

X

Unit - 05

- **Aim** : Write a program using a for loop over a sequence.
  Write a program using a while loop that asks the user for a number, and prints a count down from that number to zero.

- **Theory**

→ ⇒ What is for loop ?

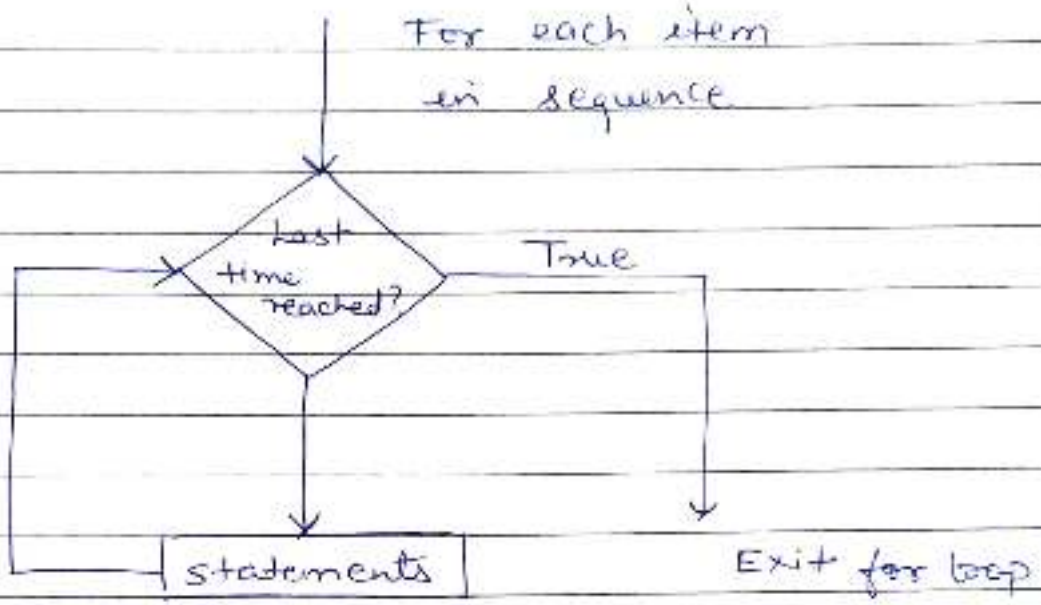
→ Python for loop is used for sequential traversal i.e. it is used for iterating over an iterable like string, tuple, list etc.

Syntax :

```
For variable in iterable :
    # statements
```

- **Flowchart of for loop**

→ See in next page >>>



- Program

→ # Python program to demonstrate continue

```
For i in range (1, 11):
    if i == 6:
        Continue
    else:
        print (i, end = " ")
```

Output :

```
1 2 3 4 5 7 8 9 10
```

- Break statement

→ Break statement in python is used to bring the control out of the loop when some external condition is triggered. Break statement is put inside

the loop body generally after if condition.

```
for i in range (1, 11)
    if i == 6 ;
        break ;
        print (i, end = " ").
```

Output :

```
1 2 3 4 5
```

- **While loop**

→ Create a variable of integer type and input the number from user.

→ Take the condition of while to be >= 0 as 0 is also to be printed inside the loop we first print the number then reduce it by 1.

→ On last iteration we get number = 0 which will be printed and then value of number = -1 which fails the while condition halting the loop and ending the program.

- Program

→ # From total number of zero

```
n = int (input ("Enter a number :"))
while (n >= 0) :
        print (n)
    n = n-1
```

Output :

```
Enter a number : 10
10
9
8
7
6
5
4
3
2
1
0
```

—x—

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16/05/2023