MCA

III SEMESTER

PYTHON PROGRAMMING LAB

Total Hours: 40 per batch

Hours/Week: 4

Max Marks: 100 **Credits: 2**

Choose any 15 Programs

PART A

1. Write a Python program to demonstrate basic data type in python

```
>>> x = 20     #int
>>> print(x)
20
>>> print(type(x))
<class 'int'>
>>> x = 20.5 #float
>>> print(x)
20.5
>>> print(type(x))
<class 'float'>
>>> x = 1j       #complex
>>> print(x)
1j
>>> print(type(x))
<class 'complex'>
>>> x = "ACYTECH.COM"  #String
>>> print(x)
ACYTECH.COM
>>> print(type(x))
<class 'str'>
>>> x = ["ACT", "TECH", "COMPANY"]      #list
>>> print(x)
['ACT', 'TECH', 'COMPANY']
>>> print(type(x))
<class 'list'>
>>> x = ("ACT", "TECH", "COMPANY")      #tuple
>>> print(x)
('ACT', 'TECH', 'COMPANY')
>>> print(type(x))
```

```
<class 'tuple'>
>>> x = {"name" : "anu", "age" : 36}  #dict
>>> print(x)
{'name': 'anu', 'age': 36}
>>> print(type(x))
<class 'dict'>
>>> x = True  #bool
>>> print(x)
True
>>> print(type(x))
<class 'bool'>
>>> x = b"Hello"  #bytes
>>> print(x)
b'Hello'
>>> print(type(x))
<class 'bytes'>
>>> x = {"APPLE", "ORGANGE", "BANANA"}   #set
>>> print(x)
{'ORGANGE', 'BANANA', 'APPLE'}
>>> print(type(x))
<class 'set'>
>>> x=frozenset({"APPLE", "ORGANGE", "BANANA"})#frozenset
>>> print(x)
frozenset({'ORGANGE', 'BANANA', 'APPLE'})
>>> print(type(x))
<class 'frozenset'>
```

2. Write a Python program to do arithmetical operations

```
# Store input numbers:
num1 = input('Enter first number: ')
num2 = input('Enter second number: ')

# Add two numbers
sum = float(num1) + float(num2)
# Subtract two numbers
min = float(num1) - float(num2)
# Multiply two numbers
mul = float(num1) * float(num2)
```

```
#Divide two numbers
div = float(num1) / float(num2)
#Divide floor two numbers
divf = float(num1) // float(num2)
#Modulus two numbers
Modul = int(num1) % int(num2)
#Power or Exponent two numbers
expo = int(num1) ** int(num2)
# Display the sum
print('The sum of {0} and {1} is {2}'.format(num1, num2, sum))
  # Display the subtraction
print('The subtraction of {0} and {1} is {2}'.format(num1, num2, min))
# Display the multiplication
print('The multiplication of {0} and {1} is {2}'.format(num1, num2, mul))
# Display the division
print('The division of {0} and {1} is {2}'.format(num1, num2, div))
# Display the division floor
print('The division floor of {0} and {1} is {2}'.format(num1, num2, divf))
# Display the Modulus
print('The Modulus of {0} and {1} is {2}'.format(num1, num2, Modul))
# Display the Power or Exponent
print('The exponent or power of {0} and {1} is {2}'.format(num1, num2, expo))
```

Output:

```
Enter first number: 3
Enter second number: 2
The sum of 3 and 2 is 5.0
The subtraction of 3 and 2 is 1.0
The multiplication of 3 and 2 is 6.0
The division of 3 and 2 is 1.0
The division floor of 3 and 2 is 1
The Modulus of 3 and 2 is 1
The power of 3 and 2 is 6
```

3. Write a Python program to find area of triangle

```
# Three sides of the triangle is a, b and c:
a = float(input('Enter first side: '))
b = float(input('Enter second side: '))
```

```
c = float(input('Enter third side: '))
  # calculate the semi-perimeter
s = (a + b + c) / 2
  # calculate the area
area = (s*(s-a)*(s-b)*(s-c)) ** 0.5
print('The area of the triangle is %0.2f' %area)
```

Output:

```
Enter first side: 5.0
Enter second side: 6.0
Enter third side: 7.0
The area of the triangle is 14.70
```

4. Write a Python program to solve quadratic equation

```
# Python program to find roots of quadratic equation
import math
# function for finding roots
def findRoots(a, b, c):
    dis_form = b * b - 4 * a * c
    sqrt_val = math.sqrt(abs(dis_form))
    if dis_form > 0:
        print(" real and different roots ")
        print((-b + sqrt_val) / (2 * a))
        print((-b - sqrt_val) / (2 * a))
    elif dis_form == 0:
        print(" real and same roots")
        print(-b / (2 * a))
    else:
        print("Complex Roots")
        print(- b / (2 * a), " + i", sqrt_val)
        print(- b / (2 * a), " - i", sqrt_val)
          a = int(input('Enter a:'))
          b = int(input('Enter b:'))
          c = int(input('Enter c:'))

          # If a is 0, then incorrect equation
          if a == 0:
```

```
    print("Input correct quadratic equation")

else:
    findRoots(a, b, c)
```

Output:

```
        Enter a:7
        Enter b:5
        Enter c:2
        Complex Roots
-0.35714285714285715  + i 5.5677643628300215
-0.35714285714285715  - i 5.5677643628300215
```

5. Write a Python program to swap two variables

```
P = int( input("Enter value for P: "))
Q = int( input("Enter value for Q: "))
# To swap the value of two variables
# we will user third variable which is a temporary variable
temp_1 = P
P = Q
Q = temp_1

print ("The Value of P after swapping: ", P)
print ("The Value of Q after swapping: ", Q)
```

Output:

```
Please enter value for P:  25
Please enter value for Q:  03
The Value of P after swapping: 03
The Value of Q after swapping: 25
```

6. Write a Python program to generate a random number

```
import random
rand_list = []
for i in range(0,10):
    n = random.randint(1,50)
    rand_list.append(n)
print(rand_list)
```

Output:

[10, 49, 16, 31, 45, 21, 19, 32, 30, 16]

7. Write a Python program to convert kilometres to miles

Method: 1 kilometre equals 0.62137 miles.
Miles = kilometre * 0.62137
And,
Kilometre = Miles / 0.62137

```
def kilometre_1(kmeter):
    conversion_ratio_1= 0.621371
    miles_1 = kmeter * conversion_ratio_1
    print ("The speed value of car in Miles: ", miles_1)
kmeter = float (input ("Enter the speed of car in Kilometre as a unit: "))
kilometre_1(kmeter)
```

Output:
Enter the speed of car in Kilometre as a unit: 16
The speed value of car in Miles: 9.941936

8. Write a Python program to convert Celsius to Fahrenheit

T(°Fahrenheit)=(T(°Celsius)*1.8)+32

T(°Fahrenheit)=(T(°Celsius)*9/5)+32

```
celsius_1 = float(input("Temperature value in degree Celsius: " ))
Fahrenheit_1 = (celsius_1 * 1.8) + 32
# print the result
print('The %.2f degree Celsius is equal to: %.2f Fahrenheit'
 %(celsius_1, Fahrenheit_1))
celsius_2 = float (input("Temperature value in degree Celsius: " ))
Fahrenheit_2 = (celsius_2 * 9/5) + 32
# print the result
print ('The %.2f degree Celsius is equal to: %.2f Fahrenheit'
 %(celsius_2, Fahrenheit_2))
```

Output:

```
Temperature value in degree Celsius:  34
The 34.00 degree Celsius is equal to: 93.20 Fahrenheit
Temperature value in degree Celsius:  23
The 23.00 degree Celsius is equal to: 73.40 Fahrenheit
```

9. Write a Python program to display calendar

```
import calendar
yy = int(input("Enter year: "))
Enter year: 2023
mm = int(input("Enter month: "))
Enter month: 4
print(calendar.month(yy,mm))
```

Output:

```
 April 2023
Mo Tu We Th Fr Sa Su
                1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
```

10. Write a Python program to Check if a Number is Positive, Negative or Zero

```
num = float(input("Input a number: "))
if num > 0:
   print("It is positive number")
elif num == 0:
   print("It is Zero")
else:
   print("It is a negative number")
```

Output:

```
Input a number : 150
It is positive number
Input a number : -150
It is negative number
Input a number : 0
It is Zero
```

Part- B

11. Python program to check if the input number is odd or even

```
num = int(input("Enter a number: "))
if (num % 2) == 0:
  print("{0} is Even".format(num))
else:
  print("{0} is Odd".format(num))
```

Output:

```
Enter a number: 15
15 is Odd
```

12. Write a Python program to Check Leap Year

```
year = int(input('Enter year : '))
 if (year%4 == 0 and year%100 != 0) or (year%400 == 0) :
    print(year, "is a leap year.")
else :
    print(year, "is not a leap year.")
```

Output:

```
Enter year : 2023
2023 is not a leap year.
```

13. Write a Python program to Check Prime Number

```
def PrimeChecker(a):
    # Checking that given number is more than 1
    if a > 1:
        # Iterating over the given number with for loop
        for j in range(2, int(a/2) + 1):
            # If the given number is divisible or not
            if (a % j) == 0:
                print(a, "is not a prime number")
                break
        # Else it is a prime number
        else:
            print(a, "is a prime number")
    # If the given number is 1
    else:
```

```
        print(a, "is not a prime number")
# Taking an input number from the user
a = int(input("Enter an input number:"))
# Printing result
PrimeChecker(a)
```

Output:

```
Enter an input number: 17
17 is a prime number
```

14. Write a Python program to Print all Prime Numbers in an Interval

```
# First, we will take the input:
lower_value = int(input ("Enter the Lowest Range Value: "))
upper_value = int(input ("Enter the Upper Range Value: "))

print ("The Prime Numbers in the range are: ")
for number in range (lower_value, upper_value + 1):
   if number > 1:
  for i in range (2, number):
 if (number % i) == 0:
     break
else:
 print (number)
```

Output:

```
Enter the Lowest Range Value:  14
Enter the Upper Range Value:  60
The Prime Numbers in the range are:
17
19
23
29
31
37
41
43
47
53
59
```

15. Write a Python program to Find the Factorial of a Number

```
num = int(input("Enter a number: "))
factorial = 1
if num < 0:
   print(" Factorial does not exist for negative numbers")
elif num == 0:
   print("The factorial of 0 is 1")
else:
   for i in range(1,num + 1):
       factorial = factorial*i
   print("The factorial of",num,"is",factorial)
```

Output:

```
Enter a number: 10
The factorial of 10 is 3628800
```

16. Write a Python program to Display the multiplication Table

```
num = int(input ("Enter the number of which the user wants to print the multipli
cation table: "))
for i in range(1, 11):
    print(num, 'x', i, '=', num*i)
```

Output:

```
Enter the number of which the user wants to print the multiplication table: 12
12 x 1 = 12
12 x 2 = 24
12 x 3 = 36
12 x 4 = 48
12 x 5 = 60
12 x 6 = 72
12 x 7 = 84
12 x 8 = 96
12 x 9 = 108
12 x 10 = 120
```

17.Write a Python program to Print the Fibonacci sequence

```
n_terms = int(input ("Enter the limit "))
# First two terms
previous= 0
current = 1
count = 0
# Now, we will check if the number of terms is valid or not
if n_terms <= 0:
   print ("Please enter a positive integer, the given number is not valid")
# if there is only one term, it will return n_1
elif n_terms == 1:
   print ("The Fibonacci sequence of the numbers up to", n_terms, ": ")
   print(previous)
# Then we will generate Fibonacci sequence of number
else:
   print ("The fibonacci sequence of the numbers is:")
   while count < n_terms:
      print(previous)
      new_ele = previous+ current
     # At last, we will update values
previous = current
      current = new_ele
      count += 1
```

Output:

```
Enter the limit  7
The fibonacci sequence of the numbers is:
      0
      1
      1
      2
      3
      5
      8
```

18.Write a Python program to Check Armstrong Number

```
number = int(input("Enter the number"))
Enter the number1245
digits = len(str(number))
temp = number
add_sum = 0
while temp != 0:
   # get the last digit in the number
   k = temp % 10
   # find k^digits
   add_sum += k**digits
   # floor division
   # which updates the number with the second last digit as the last digit
   temp = temp//10
if add_sum == number:
   print('Given number is an Armstrong Number')
else:
   print('Given number is not a Armstrong Number')
```

Output:

```
Enter the number1245
Given number is not a Armstrong Number
```

19.Write a Python program to Find Armstrong Number in an Interval

```
lower = int(input("Enter lower range: "))
upper = int(input("Enter upper range: "))
 for num in range(lower,upper + 1):
   sum = 0
   temp = num
   while temp > 0:
      digit = temp % 10
      sum += digit **
      temp //= 10
      if num == sum:
         print(num)
```

L=len(str(num)

L

Output:

```
Enter lower range: 50
Enter upper range: 100
64
```

20. Write a Python program to Find the Sum of Natural Numbers

```
num = int(input("Enter a number: "))
if num < 0:
   print("Enter a positive number")
else:
   sum = 0
   # use while loop to iterate un till zero
   while(num > 0):
      sum += num
      num -= 1
   print("The sum is",sum)
```

Output:

```
Enter a number: 50
The sum is 1275
```