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Lab report no : 06

lab report name : Programming With Python

objectives:

1) Understanding how the python function works
2) Understanding the use of global and local variables
3) Understanding how python modules works
4) Learning about the basis of networking programing with python

Theory:

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Python Features:

1) Easy to Learn and Use

2) Expressive Language

3) Interpreted Language

4) Cross-platform Language

5) Free and Open Source

6) Object-Oriented Language

7) Extensible

8) Large Standard Library

9) GUI Programming Support

10) Integrated

11. Embeddable

12. Dynamic Memory Allocation

Example: Write a Hello World program:

```
In [3]: print("Hellow World")
Hellow World
```

Example: Add Two Numbers With User Input

```
num1 = input('Enter first number: ')
num2 = input('Enter second number: ')
sum = float(num1) + float(num2)
print('The sum of {0} and {1} is {2}'.format(num1,
num2, sum))
```

output:

```
"C:\Users\sohag\PycharmProjects\
Enter first number: 4.5
Enter second number: 6.2
The sum of 4.5 and 6.2 is 10.7
```

Example: For positive numbers

```
num = 8
num_sqrt = num ** 0.5
print('The square root of %0.3f is %0.3f'%(num
,num_sqrt))
```

output:

```
"C:\Users\sohag\PycharmProjects\compu
The square root of 8.000 is 2.828
```

Example: Python Program to Calculate the Area of a Triangle

```
a = 5
b = 6
c = 7
s = (a + b + c) / 2
area = (s*(s-a)*(s-b)*(s-c)) ** 0.5
print('The area of the triangle is %0.2f' %area)
```

output:

```
"C:\Users\sohag\PycharmProjects\comp
The area of the triangle is 14.70
```

Example: Python Program to Solve Quadratic Equation

```
import cmath
a = 1
b = 5
c = 6
d = (b**2) - (4*a*c)
sol1 = (-b-cmath.sqrt(d))/(2*a)
sol2 = (-b+cmath.sqrt(d))/(2*a)
print('The solution are {0} and {1}'.format(sol1,sol2))
```

output:

```
"C:\Users\sohag\PycharmProjects\computer
The solution are (-3+0j) and (-2+0j)
```

Example: Kilometers to Miles

```
kilometers = float(input("Enter value in kilometers:
"))
conv_fac = 0.621371
miles = kilometers * conv_fac
```

```
print('%0.2f kilometers is equal to %0.2f miles'
%(kilometers,miles))
```

output:

```
"C:\Users\sohag\PycharmProjects\computer ne
Enter value in kilometers: 102
102.00 kilometers is equal to 63.38 miles
```

Example: Python Program to Check Leap Year

```
if (year % 4) == 0:
   if (year % 100) == 0:
       if (year % 400) == 0:
           print("{0} is a leap year".format(year))
       else:
           print("{0} is not a leap year".format(year))
   else:
       print("{0} is a leap year".format(year))
else:
   print("{0} is not a leap year".format(year))
```

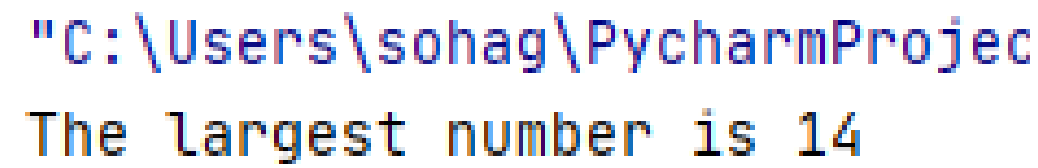
output:

```
"C:\Users\sohag\PycharmProject
2022 is not a leap year
```

Example: Python Program to Find the Largest Among Three Numbers

```
num1 = 10
num2 = 14
num3 = 12
if (num1 >= num2) and (num1 >= num3):
   largest = num1
elif (num2 >= num1) and (num2 >= num3):
   largest = num2
else:
   largest = num3
print("The largest number is", largest)
```

output:



Example: Python Program to Print all Prime Numbers in an Interval

```
lower = 900
upper = 1000
print("Prime numbers between", lower, "and", upper,
"are:")
for num in range(lower, upper + 1):
   # all prime numbers are greater than 1
   if num > 1:
       for i in range(2, num):
           if (num % i) == 0:
               break
       else:
           print(num)
```

output:

```
"C:\Users\sohag\PycharmI
Prime numbers between 9(
907
911
919
929
937
941
947
953
967
971
977
983
991
```

Example: Python Program to Find the Factorial of a Number

```
factorial = 1
if num < 0:
   print("Sorry, 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:

```
"C:\Users\sohag\PycharmProjects\
The factorial of 7 is 5040
```

Example: Python Program to Print the Fibonacci sequence

```
nterms = int(input("How many terms? "))
n1, n2 = 0, 1
count = 0
if nterms <= 0:
   print("Please enter a positive integer")
elif nterms == 1:
   print("Fibonacci sequence upto",nterms,":")
   print(n1)
else:
   print("Fibonacci sequence:")
   while count < nterms:
       print(n1)
       nth = n1 + n2
       # update values
       n1 = n2
       n2 = nth
       count += 1
```

output:

```
"C:\Users\sohag\
How many terms?
Fibonacci sequen
0
1
1
2
3
5
8
13
21
```

Example: Python Program to Convert Decimal to Binary, Octal and Hexadecimal

```
dec = 344
print("The decimal value of", dec, "is:")
print(bin(dec), "in binary.")
print(oct(dec), "in octal.")
print(hex(dec), "in hexadecimal.")
```

output:

```
"C:\Users\sohag\PycharmProject
The decimal value of 344 is:
0b101011000 in binary.
0o530 in octal.
0x158 in hexadecimal.
```

Example: Python Program to Find ASCII Value of Character

```
c = 'p'
print("The ASCII value of '" + c + "' is", ord(c))
```

output:

```
"C:\Users\sohag\PycharmProjects\co
The ASCII value of 'p' is 112
```