Python Basics Program:

- Print Hello world! :

```
#this program prints Hello, world!

print('Hello, world!')
```

- Declare the following variables:

Int, Float, Boolean, String & print its value

```
a = 5
print (a, "is of type", type (a))

a = 2.0
print (a, "is of type", type (a))

test = []
print (test, 'is', bool (test))

test = [0]
print (test, ‘is’, bool (test))

test = 0.0
print (test, 'is', bool (test))
#All of the following are equivalent
my_string = 'Hello'
```

```
print (my_string)

my_string = "Hello"
print (my_string)

my_string = '''Hello'''
print (my_string)

#triple quotes string can extend multiple lines
my_string = """Hello, welcome to
        the world of Python"""
print (my_string)
```

- ## Program to calculate the Area Of Triangle:

```
# Python Program to find the area of triangle
a = 5
b = 6
c = 7

# Uncomment below to take inputs from the user
# 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)
```

- ## Program to swap two variables:

```
# Python program to swap two variables (using Temp var)
#to take input from the user
# x = input ('Enter value of x: ')
# y = input ('Enter value of y: ')

x = 5
y = 10

#create a temporary variable and swap the values
temp = x
x = y
y = temp

print (‘the value of x after swapping: {}'.format(x))
print ('the value of y after swapping: {}'.format(y))
```

Without Using Temp:

Logic:

```
x = x + y
y = x –y
x = x - y
```

- Program is to check if a number is positive, negative or 0 (Using If…elif…else).

```
num = float (input ("Enter a number: "))
if num > 0:
print ("Positive number")
elif num == 0:
 print ("Zero")
else:
print ("Negative number")
```

Using Nested If:

```
num = float (input ("Enter a number: "))
if num >= 0:
   if num == 0:
      print("Zero")
   else:
      print ("Positive number")
else:
   print("Negative number")
```

- Program is to check if a number is Even or Odd:

```
# Python program to check if the input number is odd or even.
#a number is even if division by 2 gives a remainder of 0
# If remainder is 1, it is odd number.

num = int (input ("Enter a number: "))
if (num % 2) == 0:
```

```
  print ("{0} is Even".format (num))
else:
  print ("{0} is Odd".format (num))
```

- Program to print Odd number within a given range:

```
lower= int (input ("Enter the lower limit for the range :"))
Upper= int (input ("Enter the upper limit for the range :"))
for i in range (lower, upper+1):
   If (i%2! =0):
      print (i)
```

- Python program to find the factorial of a number:

#Without using recursion:

```
n=int (input ("Enter number :"))
fact =1
while (n>0):
   fact =fact*n
   n=n-1
print("Factorial of the number is: ")
print(fact)
```

Using Recursion:

```
def recur_factorial (n):
  """Function to return the factorial
```

```
  of a number using recursion"""
   if n == 1:
       return n
   else:
       return n*recur_factorial (n-1)

# Change this value for a different result
num = 7

# uncomment to take input from the user
#num = int (input ("Enter a number: "))
#check is the number is negative
if num < 0:
print ("Sorry, factorial does not exist for negative
numbers")
elif num == 0:
 print("The factorial of 0 is 1")
else:
 print("The factorial of", num,"is", recur_factorial
(num))
```

- ## Program to reverse a given number:

```
n=int (input ("Enter number: "))
rev =0
while (n>0):
    dig =n%10
    rev =rev*10+dig
    n =n//10
print ("Reverse of the number:", rev)
```

- ## Program to find out the sum of Natural numbers.

 # Python program to find the sum of natural numbers up to n where n is provided by user

```
# change this value for a different result
num = 16
# uncomment to take input from the user
#num = int (input ("Enter a number: "))
if num < 0:
print ("Enter a positive number")
else:
 sum = 0
 #use while loop to iterate until zero
while (num > 0):
sum += num
num -= 1
print ("The sum is", sum)
```

Strings:

Program to reverse a string without using recursion:

```
a=str(input ("Enter a string: "))
print("Reverse of the string is: ")
print(a[::-1])
```

Using Recursion:

```
def reverse(string):
    if len(string) == 0:
        return string
    else:
        return reverse (string [1:]) + string[0]
a = str(input("Enter the string to be reversed: "))
print(reverse (a))
```

Using Loop:

```
# Python code to reverse a string

# using loop

def reverse(s):

  str = ""

  for i in s:
```

```
    str = i + str
  return str
s = "Geeksforgeeks"
print ("The original string is: ", end="")
print (s)

print ("The reversed string (using loops) is: ", end="")
print (reverse(s))
```

Program to check if string is palindrome or not

```
# Program to check if a string
# is palindrome or not
# change this value for a different output
my_str = 'aIbohPhoBiA'

#make it suitable for ceaseless comparison
my_str = my_str.casefold()
```

```
#reverse the string
rev_str = reversed (my_str)


# check if the string is equal to its reverse
if list (my_str) == list(rev_str):
   print("It is palindrome")
else:
   print("It is not palindrome")
```

Python Program to Replace all Occurrences of ‘a’ with $ in a String:

```
string =raw_input ("Enter string :")
string= string.replace('a','$')
string= string.replace('A','$')
print("Modified string:")
print(string)
```

Python Program to Count the Number of Vowels in a String

```
string =raw_input("Enter string:")

vowels =0

for i in string:

    if(i=='a' or i=='e' or i=='i' or i=='o' or i=='u' or i=='A' or i=='E' or i=='I' or i=='O' or i=='U'):

        vowels=vowels+1

print("Number of vowels are:")

print(vowels)
```

Input Two Strings and Display the Larger String without Using Built-in Functions:

```
string1=raw_input ("Enter first string :")

string2=raw_input ("Enter second string :")

count1=0

count2=0

for i in string1:
```

```
    count1=count1+1
for j in string2:
    count2=count2+1
if (count1<count2):
    print ("Larger string is :")
    print (string2)
elif(count1==count2):
    print("Both strings are equal.")
else:
    print("Larger string is:")
    print(string1)
```

Count the number of digits & letter in a string:

```
String=raw_input ("Enter string :")
word=raw_input("Enter word :")
a= []
count= 0
```

```
a=string.split(" ")
for i in range (0,len(a)):
    if (word==a[i]):
        count=count+1
print ("Count of the word is:")
print(count)
```

Count Number of Lowercase Characters in a String:

```
string=raw_input ("Enter string:")
count=0
for i in string:
    if (i.islower()):
        count=count+1
print("The number of lowercase characters is :")
print(count)
```

Program to check if a Substring is Present in a Given String:

```
string=raw_input ("Enter string:")

sub_str=raw_input ("Enter word :")

if (string.find(sub_str)==-1):

    print ("Substring not found in string!")

else:

    print("Substring in string!")
```

Lists & Tuples:

Program to Find the Largest Number in a List:

```
a = []
n=int (input ("Enter number of elements :"))
for i in range (1, n+1):
    b=int (input ("Enter element :"))
    a.append(b)
a.sort()
print("Largest element is:",a[n-1])
```

Program to Put Even and Odd elements in a List into Two Different Lists:

```
a= []
n=int (input ("Enter number of elements :"))
for i in range (1,n+1):
    b=int (input ("Enter element :"))
    a.append(b)
```

```
even = []
odd = []
for j in a:
    if (j%2==0):
        even.append(j)
    else:
        odd.append(j)
print ("The even list”, even)
print ("The odd list”, odd)
```

Program to Read a List of Words and Return the Length of the Longest One:

```
a = []
n= int(input("Enter the number of elements in list:"))
for x in range (0, n):
    element =input ("Enter element" + str(x+1) + ":")
    a.append(element)
max1=len (a[0])
```

```
temp =a [0]
for i in a:
    if (len(i)>max1):
        max1= len (i)
        temp=i
print("The word with the longest length is :")
print(temp)
```

Create a List of Tuples with the First Element as the Number and Second Element as the Square of the Number:

```
l_range=int (input ("Enter the lower range :"))
u_range=int (input ("Enter the upper range :"))
a= [(x,x**2) for x in range(l_range,u_range+1)]
print (a)
```

Program to Remove the Duplicate Items from a List:

```
a = []
n= int (input ("Enter the number of elements in list :"))
for x in range (0,n):
    element=int (input ("Enter element" + str(x+1) + ":"))
    a.append (element)
b = set ()
unique = []
for x in a:
    if x not in b:
        unique.append(x)
        b.add(x)
print ("Non-duplicate items :")
print(unique)
```

Dictionary:

Program to Check if a Given Key Exists in a Dictionary or Not:

```
d= {'A':1,'B':2,'C':3}

key= raw_input ("Enter key to check :")

if key in d.keys ():

    print ("Key is present and value of the key is :")

    print (d[key])

else:

    print("Key isn't present!")
```

Program to Sum All the Items in a Dictionary:

```
d= {'A':100,'B':540,'C':239}

print ("Total sum of values in the dictionary :")

print (sum (d.values ()))
```

Program to Remove the Given Key from a Dictionary:

```
d = {'a':1,'b':2,'c':3,'d':4}

print ("Initial dictionary")

print (d)

key = raw_input ("Enter the key to delete (a-d) :")

if key in d:

    del d [key]

else:

    print("Key not found!")

    exit (0)

print ("Updated dictionary")

print (d)
```

Write a Python program to iterate over dictionaries using for loops:

```
d = {'Red': 1, 'Green': 2, 'Blue': 3}

for color_key, value in d.items():
```

```
print(color_key, 'corresponds to ', d [color_key])
```

Write a Python program to sort a dictionary by key:

```
color_dict = {'red':'#FF0000',
        'green':'#008000',
        'black':'#000000',
        'white':'#FFFFFF'}
for key in sorted (color_dict):
    print("%s: %s" % (key, color_dict[key]))
```