1.Write a program to demonstrate different number data types in Python.

```
a=10;                              #Integer Data type
b=11.5;                            #Float Data type
c=2.05j;                           #Complex Number
print("a is Type of",type(a));     #prints type of variable a
print("b is Type of",type(b));     #prints type of variable b
print("c is Type of",type(c));     #prints type of variable c
```

Output:

```
E:\Python>python week1.py
a is Type of <class 'int'>
b is Type of <class 'float'>
c is Type of <class 'complex'>
```

2.Write a program to perform different Arithmetic Operations on numbers in Python.

```
a=int(input("Enter a value"));          #input() takes data from console at runtime as string.
b=int(input("Enter b value"));          #typecast the input string to int.
print("Addition of a and b ",a+b);
print("Subtraction of a and b ",a-b);
print("Multiplication of a and b ",a*b);
print("Division of a and b ",a/b);
print("Remainder of a and b ",a%b);
print("Exponent of a and b ",a**b);          #exponent operator (a^b)
print("Floar division of a and b ",a//b);    # floar division
```

Output:

```
E:\Python>python week2.py
Enter a value3
Enter b value2
Addition of a and b  5
Subtraction of a and b  1
Multiplication of a and b  6
Division of a and b  1.5
Remainder of a and b  1
Exponent of a and b  9
Floar division of a and b  1
```

3. Write a program to create, concatenate and print a string and accessing sub-string from a given string.

```
s1=input("Enter first String : ")
s2=input("Enter second String : ")
print("First string is : ",s1)
```

```
print("Second string is : ",s2)
print("concatenations of two strings :",s1+s2)
print("Substring of given string :",s1[1:4])
```

Out put:

```
Enter first String : python
Enter second String : progrmming
First string is :  python
Second string is :  progrmming
concatenations of two strings : pythonprogrmming
Substring of given string : yth
```

4. Write a python script to print the current date in the following format “Sun May 29 02:26:23 IST 2017”

```
import time
import datetime
x =datetime.datetime.now()
print(x.strftime("%c"))
```

Out Put:

Mon Mar 27 15:12:29 2023

5. Write a program to create, append, and remove lists in python

```
pets = ['cat', 'dog', 'rat', 'pig', 'tiger']
snakes=['python','anaconda','fish','cobra','mamba']
print("Pets are :",pets)
```

```
print("Snakes are :",snakes)

animals=pets+snakes

print("Animals are :",animals)

snakes.remove("fish")

print("updated Snakes are :",snakes)
```

Output:

```
Pets are : ['cat', 'dog', 'rat', 'pig', 'tiger']
Snakes are : ['python', 'anaconda', 'fish', 'cobra', 'mamba']
Animals are : ['cat', 'dog', 'rat', 'pig', 'tiger', 'python', 'anaconda', 'fish', 'cobra', 'mamba']
updated Snakes are : ['python', 'anaconda', 'cobra', 'mamba']
```

6. Write a program to demonstrate working with tuples in python

```
# creating tuples with college names..

colleges = ("SIIET","BHARAT","GNIT", "AVN")

print("the lists in colleges tuple is",colleges)

print("we can\'t add or remove new elements in a tuple")

print("length of the tuple colleges is:",len(colleges))

# checking whether 'SIIET' is present in the tuple or not

if "SIIET" in colleges:

    print("Yes, 'SIIET' is in the colleges tuple")
```

Out Put:

```
the lists in colleges tuple is ('SIIET', 'BHARAT', 'GNIT', 'AVN')
we can't add or remove new elements in a tuple
length of the tuple colleges is: 4
Yes, 'SIIET' is in the colleges tuple
```

7. Write a program to demonstrate working with dictionaries in python.

```
dict1 = {'StdNo':'532','StuName': 'Naveen', 'StuAge': 21, 'StuCity': 'Hyderabad'}
print("\n Dictionary is :",dict1)
#Accessing specific values
print("\n Student Name is :",dict1['StuName'])
print("\n Student City is :",dict1['StuCity'])
#Display all Keys
print("\n All Keys in Dictionary ")
for x in dict1:
 print(x)
#Display all values
print("\n All Values in Dictionary ")
for x in dict1:
 print(dict1[x])
#Adding items
dict1["Phno"]=85457854
#Updated dictoinary
print("\n Uadated Dictionary is :",dict1)
#Change values
dict1["StuName"]="Madhu"
#Updated dictoinary
print("\n Uadated Dictionary is :",dict1)
#Removing Items
dict1.pop("StuAge");
#Updated dictoinary
print("\n Uadated Dictionary is :",dict1)
#Length of Dictionary
print("Length of Dictionary is :",len(dict1))
```

```
#Copy a Dictionary

dict2=dict1.copy()

#New dictoinary

print("\n New Dictionary is :",dict2)

#empties the dictionary

dict1.clear()

print("\n Uadated Dictionary is :",dict1)
```

Output:

```
Dictionary is : {'StdNo': '532', 'StuName': 'Naveen', 'StuAge': 21, 'StuCity': 'Hyderabad'}

 Student Name is : Naveen

 Student City is : Hyderabad

 All Keys in Dictionary
StdNo
StuName
StuAge
StuCity

 All Values in Dictionary
532
Naveen
21
Hyderabad

 Uadated Dictionary is : {'StdNo': '532', 'StuName': 'Naveen', 'StuAge': 21, 'StuCity': 'Hydera
bad', 'Phno': 85457854}

 Uadated Dictionary is : {'StdNo': '532', 'StuName': 'Madhu', 'StuAge': 21, 'StuCity': 'Hydera
bad', 'Phno': 85457854}

 Uadated Dictionary is : {'StdNo': '532', 'StuName': 'Madhu', 'StuCity': 'Hyderabad', 'Phno': 8
5457854}
Length of Dictionary is : 4

 New Dictionary is : {'StdNo': '532', 'StuName': 'Madhu', 'StuCity': 'Hyderabad', 'Phno': 8545
7854}

 Uadated Dictionary is : {}
```

8. Write a python program to find largest of three numbers.

```
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))
num3 = int(input("Enter third number: "))
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:

```
Enter first number: 54
Enter second number: 43
Enter third number: 78
The largest number is 78
```

9) Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [Formula: c/5 = f-32/9]

Source code:

```
print("Options are \n")
print("1.Convert temperatures from Celsius to Fahrenheit \n")
print("2.Convert temperatures from Fahrenheit to Celsius \n")
opt=int(input("Choose any Option(1 or 2) : "))
if opt == 1:
 print("Convert temperatures from Celsius to Fahrenheit \n")
 cel = float(input("Enter Temperature in Celsius: "))
 fahr = (cel*9/5)+32
 print("Temperature in Fahrenheit =",fahr)
elif opt == 2:
 print("Convert temperatures from Fahrenheit to Celsius \n")
 fahr = float(input("Enter Temperature in Fahrenheit: "))
```

```
 cel=(fahr-32)*5/9;
 print("Temperature in Celsius =",cel)
else:
 print("Invalid Option")
```

Out Put:

```
Options are

1.Convert temperatures from Celsius to Fahrenheit

2.Convert temperatures from Fahrenheit to Celsius

Choose any Option(1 or 2) : 1
Convert temperatures from Celsius to Fahrenheit

Enter Temperature in Celsius: 34
Temperature in Fahrenheit = 93.2
```

10) Write a python program to construct the following pattern using nested for loop:

```
*
**
***
****
*****
*****
****
***
**
*
```

Source code:

```
n=int(input("ENTER A VALUE:"))
for x in range(0,n+1,1):
  print(x*'*')
if(x==n):
   for x in range(n,0,-1):
```

```
    print(x*'*')
```

Output:

ENTER A VALUE:5

```
*
**
***
****
*****
*****
****
***
**
*
```

9. Write a Python script that prints prime numbers less than 20.

```
print("Prime numbers between 1 and 20 are:")
ulmt=20;
for num in range(ulmt):
  # prime numbers are greater than 1
  if num > 1:
     for i in range(2,num):
        if (num % i) == 0:
           break
     else:
        print(num)
```

Output:

```
Prime numbers between 1 and 20 are:
2
3
5
7
11
13
```

17
19

10. Write a python program to find factorial of a number using Recursion.

```
def recursion(n):
    if(n<1):
      print("FACTORIAL NOT POSSIBLE!!")
 elif(n>1):
     return n*recursion(n-1)
 else:
    return 1
n=int(input("enter a number:"))
print("factorial of",n,"is:",recursion(n))
```

Output:

```
enter a number:5
factorial of 5 is: 120
```

13) Write a program that accepts the lengths of three sides of a triangle as inputs. The program output should indicate whether or not the triangle is a right triangle (Recall from the Pythagorean Theorem that in a right triangle, the square of one side equals the sum of the squares of the other two sides).

```
base=float(input("Enter length of Base : "))
perp=float(input("Enter length of Perpendicular : "))
hypo=float(input("Enter length of Hypotenuse : "))

if hypo**2==((base**2)+(perp**2)):
    print("It's a right triangle")
else:
    print("It's not a right triangle")
```

OutPut

```
Enter length of Base: 3
Enter length of Perpendicular: 4
Enter length of Hypotenuse: 5
It's a right triangle
```

14. Write a python program Fibonacci Numbers

```
def fibonacci(n):
```

```
  if n == 0:
    return 0
  elif n == 1:
    return 1
  else:
    return fibonacci(n-1) + fibonacci(n-2)

# Generate the first 10 numbers in the Fibonacci series
for i in range(10):
    print(fibonacci(i))
```

Output

```
0
1
1
2
3
5
8
13
21
34
```

16. Write a script named **copyfile.py**. This script should prompt the user for the names of two text files. The contents of the first file should be input and written to the second file .

```
#Note: create a text file as “input.txt” and write some date in it. This will be used in the program.

with open("input.txt") as input:

    with open("output.txt","w") as output:

        for line in input: output.write(line)

print("JOB DONE!!")
```

Ouput:

```
JOB DONE!!
```

17) Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.

```
fname = input("Enter file name: ")

fh = open(fname)

lst = list()                    # list for the desired output

words=[];

for line in fh:                  # to read every line of file romeo.txt

   words += line.split()

words.sort()


# display the sorted words


print("The unique words in  alphabetical order are:")

for word in words:

   if word in lst:         # if element is repeated

         continue             # do nothing

   \else:                  # else if element is not in the list

         lst.append(word)

         print(word)

#print(lst)
```

Output

```
Enter file name: input.txt
The unique words in  alphabetical order are:
cmrtc
to
welcome
```

15) Write a python program to define a module and import a specific function in that module to another program

 # arth.py

```
''' Arithmetic Operations Module with Multiple functions'''
def Add(a,b):
```

```
    c=a+b
return c
def Sub(a,b):
    c=a-b
return c
def Mul(a,b):
    c=a*b
return c
```

```
from arth import Add
num1=float(input("Enter first Number : "))
num2=float(input("Enter second Number : "))
print("Addition is : ",Add(num1,num2))
print("Subtraction is : ",Sub(num1,num2))  #gives error:Not importing Sub function from arth Module
```

Output:

```
E:\Python>python week15.py
Enter first Number : 10
Enter second Number : 20
Addition is :  30.0
Traceback (most recent call last):
  File "week15.py", line 7, in <module>
    print("Subtraction is : ",Sub(num1,num2)) #gives error:Not importing Sub function from arth Module
NameError: name 'Sub' is not defined
```

1) Write a Python class to convert an integer to a roman numeral.

```
class irconvert:
    num_map = [(1000, 'M'), (900, 'CM'), (500, 'D'), (400, 'CD'), (100, 'C'), (90,
'XC'),(50, 'L'), (40, 'XL'), (10, 'X'), (9, 'IX'), (5, 'V'), (4, 'IV'), (1, 'I')]

    def num2roman(self,num):
        roman = ''
        while num > 0:
            for i, r in self.num_map:
                while num >= i:
                    roman += r
                    num -= i
        return roman
num=int(input("Enter any Number :"))
print("Roman Number is : ",irconvert().num2roman(num))
```

Out Put:

```
Enter any Number :50
Roman Number is :  L
```

2) Write a Python class to implement pow(x, n)

```
class py_power:
   def power(x,n):
      print("power of given literals:\nx:",x,"\nn\n:",n,"is:",x**n)
x=float(input("ENTER X(BASE) VALUE:"))
n=float(input("ENTER N(POWER) VALUE:"))
py_power.power(x,n)
```

Out Put:

```
ENTER X(BASE) VALUE:34.5
ENTER N(POWER) VALUE:4
power of given literals:
x: 34.5
n
: 4.0 is: 1416695.0625
```

3) **Write a Python class to reverse a string word by word**.

```
class py_reverse:
  def revr(self, strs):
     sp=strs.split()
     sp.reverse()
     res=" ".join(sp)
     return res

str1=input("Enter a string with 2 or more words : ")
print("Reverse of string word by word: \n",py_reverse().revr(str1));
```

Out Put:

```
Enter a string with 2 or more words : IT Students
Reverse of string word by word:
 Students IT
```