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

```
a=10
b="Python"
c = 10.5
d=2.14j
e=True
print("Data type of Variable a :",type(a))
print("Data type of Variable b :",type(b))
print("Data type of Variable c :",type(c))
print("Data type of Variable d :",type(d))
print("Data type of Variable e :",type(e))
```

Output:

```
Data type of Variable a : <class 'int'>
Data type of Variable b : <class 'str'>
Data type of Variable c : <class 'float'>
Data type of Variable d : <class 'complex'>
Data type of Variable e : <class 'bool'>
```

2. Create a list and perform the following methods.

a) insert( ) b) remove( ) c) append( ) d) pop( ) e) clear( )

```
a=[1,3,5,6,7,4,"hello"]
print("The list created is", a)
#insert()
a.insert(3,20)
print("Insert the element 20 at index position 3.  The modified list is\n", a)
#remove()
a.remove(7)
print("Remove the element 7 from the list. The modified list is \n", a)
#append()
a.append("hi")
print("Appended the list with a string\n", a)
c=len(a)
print("The length of the list is \n", c)
#pop()
a.pop()
print("After popping the element from the list \n", a)
a.pop(6)
print("After popping the element at index position 6 from the list, modified list is
\n", a)
# clear()
a.clear()
print("The cleared list is \n", a)
```

Output:

```
The list created is [1, 3, 5, 6, 7, 4, 'hello']
Insert the element 20 at index position 3.  The modified list is
 [1, 3, 5, 20, 6, 7, 4, 'hello']
Remove the element 7 from the list. The modified list is
 [1, 3, 5, 20, 6, 4, 'hello']
Appended the list with a string
```

```
 [1, 3, 5, 20, 6, 4, 'hello', 'hi']
The length of the list is : 8
After popping the element from the list
 [1, 3, 5, 20, 6, 4, 'hello']
After popping the element at index position 6 from the list, modified list is
 [1, 3, 5, 20, 6, 4]
The cleared list is
 []
```

3. Create a tuple and perform the following methods.
a) Add items b) len( ) c) Check for item in tuple d) Access items

```
rainbow=("v","i","b","g","y","o","r")
print("The tuple of alphabets creating a rainbow is \n", rainbow)
colour=("violet","Indigo","blue","green","yellow","orange","red")
print("The tuple of colours in a rainbow is \n", colour)

# Add items in tuples
rainbow_colour=rainbow+colour
print("Concatenating the two tuples we get \n", rainbow_colour)
#length of the tuple
c=len(rainbow_colour)
print("The length of the concatenated tuple is", c)
# check for item in tuple
print("Item prsent in the list it returns True Or Else False")
if "blue" in rainbow_colour:
 print(True)
else:
 print(False)

#Access items in tuple
print("Printing the item rainbow[2]: of tuple",rainbow[2])
"""rainbow[1:3] means all the items in rainbow tuple
starting from an index value of 1 up to an index value of 3 excluding 3"""
print("Printing the items rainbow[1:3]",rainbow[1:3])
print("Printing the items rainbow[0:4]",rainbow[0:4])
```

Output:

The tuple of alphabets creating a rainbow is

('v', 'i', 'b', 'g', 'y', 'o', 'r')

The tuple of colours in a rainbow is

('violet', 'Indigo', 'blue', 'green', 'yellow', 'orange', 'red')

Concatenating the two tuples we get

('v', 'i', 'b', 'g', 'y', 'o', 'r', 'violet', 'Indigo', 'blue', 'green', 'yellow', 'orange', 'red')

The length of the concatenated tuple is 14

If Item present in the list it returns True Or Else False

True

Printing the item rainbow[2]: of tuple b

Printing the items rainbow[1:3] ('i', 'b')

Printing the items rainbow[0:4] ('v', 'i', 'b', 'g')

4. Create a dictionary and apply the following methods.
1. Print the dictionary items 2. Access items 3. Use get( ) 4. Change Values

5. Use len( )

#Source code:

```
# creating a dictionary
college={'name': "QIS", 'code': "QISIT",'pincode': 560050 }
print(college)
#adding items to dictionary
college["location"] = "IBP"
print(college)
#changing values of a key
college["location"] = "vijayawada"
print(college)
#know the length using len()
print("length of college is:",len(college))
#Acess items
print("college['name']:",college['name'])
# use get ()
x=college.get('pincode')
print(x)
#to copy the same dictionary use copy()
mycollege= college.copy()
print(mycollege)
```

Output:

```
{'name': 'QIS', 'code': 'QISIT', 'pincode': 560050}
{'name': 'QIS', 'code': 'QISIT', 'pincode': 560050, 'location': 'IBP'}
{'name': 'QIS', 'code': 'QISIT', 'pincode': 560050, 'location': 'vijayawada'}
length of college is: 4
college['name']: QIS
560050
{'name': 'QIS', 'code': 'QISIT', 'pincode': 560050, 'location': 'vijayawada'}
```

5. Write a programto create a menu with the following options
1. TO PERFORM ADDITITON 2.TO PERFORM SUBTRACTION3. TO PERFORM MULTIPICATION
4. TO PERFORM DIVISION
Accepts users input and perform the operation accordingly. Use functions with arguments.

```
def add(n1,n2):
 return n1+n2
def sub(n1,n2):
 return n1-n2
def mul(n1,n2):
 return n1*n2
def div(n1,n2):
 return n1/n2
print("Welcome to the Arithmetic Program")
print("1. TO PERFORM ADDITION")
print("2. TO PERFORM SUBTRACTION")
print("3. TO PERFORM MULTIPLICATION")
print("4. TO PERFORM DIVISION")
print("0. To Exit")
x = int(input(" Enter the first number\n"))
y = int(input(" Enter the second number\n"))
choice =1
while(choice!=0):
 choice = int(input("Enter your choice"))
 if choice == 1:
    print(x, "+" ,y ,"=" ,add(x,y))
 elif choice == 2:
    print(x, "-" ,y ,"=" ,sub(x,y))
 elif choice == 3:
    print(x, "*" ,y ,"=" ,mul(x,y))
 elif choice == 4:
    print(x, "%" ,y ,"=" ,div(x,y))
 elif choice ==0:
```

```
    print("Exit")
 else:
    print("Invalid Choice");
```

Output:

```
Welcome to the Arithmetic Program
1. TO PERFORM ADDITION
2. TO PERFORM SUBTRACTION
3. TO PERFORM MULTIPLICATION
4. TO PERFORM DIVISION
0. To Exit
 Enter the first number
12
 Enter the second number
4
Enter your choice : 1
12 + 4 = 16
Enter your choice : 2
12 - 4 = 8
Enter your choice : 3
12 * 4 = 48
Enter your choice : 4
12 % 4 = 3.0
Enter your choice : 5
Invalid Choice
Enter your choice : 0
Exit
```

6.Write a Program to print a number is Positive / Negative using if-else

```
print("Program to print a number is Positive / Negative")
choice =1
while(choice!=0):
 number=int(input("Enter a Number :"))
 if number >0:
    print("The Number",number,"is Positive")
 elif number <0:
    print("The Number",number, "is negative")
 else:
    print("ZERO is a Neutral number ")
 choice=int(input("Do you wish to continue 1/0 :"))
```

Output:

```
Program to print a number is Positive / Negative
Enter a Number : 5
The Number 5 is Positive
Do you wish to continue 1/0 : 1
Enter a Number : -8
The Number -8 is negative
Do you wish to continue 1/0 : 1
Enter a Number : 0
ZERO is a Neutral number
Do you wish to continue 1/0 : 0
```

7. Write a program to filter only even numbers from a given list.(without using filter function).

```
def find_even_numbers(list_items):
    print(" The EVEN numbers in the list are: ")
    for item in list_items:
        if item%2==0:
            print(item)
def main():
 list1=[2,3,6,8,48,97,56]
 find_even_numbers(list1)
if __name__=="__main__":
         main()
```

Output:

The EVEN numbers in the list are:
2
6
8
48
56

7. Write a program for filter() to filter only even numbers from a given list.

```
def even(x):
    return x % 2 == 0
a=[2,5,7,16,8,9,14,78]
result=filter(even,a)
print(" original List is :",a)
print(" Filtered list is : ",list(result))
```

Output:

original List is : [2, 5, 7, 16, 8, 9, 14, 78]
Filtered list is : [2, 16, 8, 14, 78]

8.Write a python program to print date, time for today and now.

```
import datetime
a=datetime.datetime.today()
b=datetime.datetime.now()
print("now date and time is:",b)
print("Today date is :",a)
print("current year :",a.year)
print("current month :",a.month)
print("current day :",a.day)
print(a.strftime("%a"))
print(a.strftime("%b"))
print(a.strftime("%c"))
```

Output:

```
now date and time is: 2023-02-28 19:39:01.936566
Today date is : 2023-02-28 19:39:01.936567
current year : 2023
current month : 2
current day : 28
Tue
Feb
Tue Feb 28 19:39:01 2023
```

9. Write a python program to add some days to your present date and print the date added.

```
from datetime import datetime
from datetime import timedelta
from datetime import date

# taking input as the current date
# today() method is supported by date
# class in datetime module
Begindatestring = date.today()
 # print begin date

print("Beginning date")
print(Begindatestring)

# calculating end date by adding 4 days
Enddate = Begindatestring + timedelta(days=10)

# printing end date
print("Ending date")
print(Enddate)
```

Output:

```
Beginning date

2023-02-28

Ending date

2023-03-10
```

10. Write a program to count the number of characters ina string and store them in a dictionary data structure.

```
def construct_character_dict(word):
    character_count_dict=dict()
    for each_character in word:
            character_count_dict[each_character]=character_count_dict.get(each_character,0)+1
    print(character_count_dict)

def main():
   word=input("enter a string :")
   construct_character_dict(word)
if __name__=="__main__":
   main()
```

Output:

enter a string :klebca

{'k': 1, 'l': 1, 'e': 1, 'b': 1, 'c': 1, 'a': 1}

11. Write a python program count frequency of characters in a given file

Source Code:

```
import collections
import pprint
file_input = input('File Name: ')
with open(file_input, 'r') as info:
    count = collections.Counter(info.read().upper())
    value = pprint.pformat(count)
print(value)
```

Output:

File Name: gfg.txt
Counter({'L': 4,
'E': 3,
' ': 3,
'A': 3,
'.': 2,
'N': 2,
'I': 2,
'G': 2,
'P': 2,
'K': 1,
'"': 1,
'S': 1,
'J': 1,
'C': 1,
'O': 1})

12. Using a numpy module create an array and check the following:
1. Type of array 2. Axes of array3. Shape of array 4. Type of elements in array

```
import numpy as np

arr=np.array([[1,2,3],[4,2,5]])

print("Array is of type:",type(arr))

print("no.of dimensions:",arr.ndim)

print("Shape of array:",arr.shape)

print("Size of array:",arr.size)

print("Array stores elements of type:",arr.dtype)
```

Output:

Array is of type: <class 'numpy.ndarray'>

no.of dimensions: 2

Shape of array: (2, 3)

Size of array: 6

Array stores elements of type: int32

13.Write a python program to concatenate the dataframes with two different objects.

```
import pandas as pd
one=pd.DataFrame({'Name':['teju','gouri'], 'age':[19,20]},
index=[1,2])
two=pd.DataFrame({'Name':['suma','nammu'], 'age':[20,21]},
index=[3,4])
print(pd.concat([one,two]))
```

Output:

	Name	age
1	teju	19
2	gouri	20
3	suma	20
4	nammu	21

14. Write a python code to read a csv file using pandas module and print frist five and last five lines of a file.

Source Code:

```
import pandas as pd

pd.set_option('display.max_rows', 50)

pd.set_option('display.max_columns', 50)

diamonds = pd.read_csv('List.csv')

print("First 5 rows:")

print(diamonds.head())

print("Last 5 rows:")

print(diamonds.tail())
```

Output:

First 5 rows:

	REG NO	NAME	COURSE	FEES	LANGUAGE
0	101	jagan	BCA	100000	KAN
1	102	jithin	Bcom	100000	HIN
2	103	preethi	BCA	100000	KAN
3	104	manoj	BBA	30000	HIN
4	105	nikitha	MBA	200000	TEL

Last 5 rows:

	REG NO	NAME	COURSE	FEES	LANGUAGE
6	107	pavan ts	Mtech	600000	TAMIL
7	108	ramu	BSC	45000	KAN
8	109	radha	BCA	100000	KAN
9	110	sita	BCA	100000	KAN
10	111	raj	BCom	100000	TEL

15. WAP which accepts the radius of a circle from user and compute the area(Use math module)

```
import math as M
radius = float(input("Enter the radius of the circle :  "))
area_of_circle = M.pi*radius*radius
circumference_of_circle = 2*M.pi*radius
print("the area of circle is", area_of_circle)
print("the circumference of circle is", circumference_of_circle)
```

Output:

```
Enter the radius of the circle:  45
The area of circle is 6361.725123519332
The circumference of circle is 282.7433388230814
```