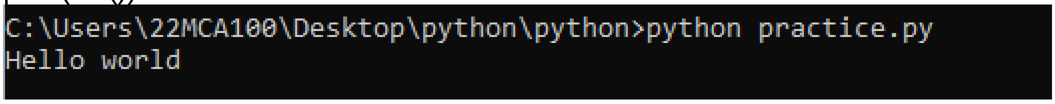
PYTHON PROGRAMMING AND DATA SCIENCE

Assignment:1

1. Write a program to print "Hello World" using function.

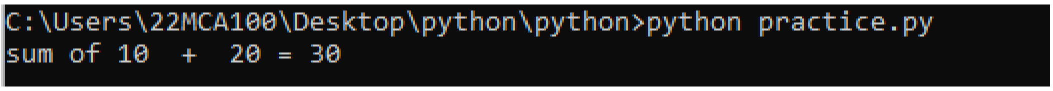
```
def hw():
        return "Hello world"
print(hw())
```



```
C:\Users\22MCA100\Desktop\python\python>python practice.py
Hello world
```

2. Write a program to add two numbers and print the result

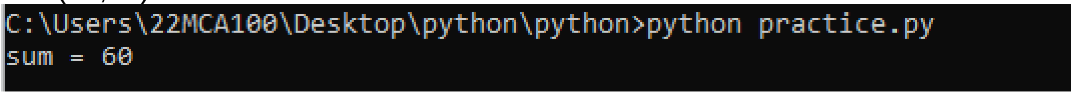
```
a=10
b=20
print("sum of",a," + ",b,"=",(a+b))
```



```
C:\Users\22MCA100\Desktop\python\python>python practice.py
sum of 10  +  20 = 30
```

3. Write a program to add two numbers and print the result using function.

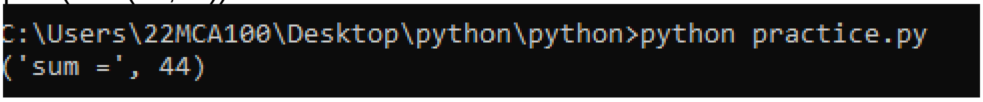
```
def sum(a,b):
        print("sum =",a+b)

sum(10,50)
```



```
C:\Users\22MCA100\Desktop\python\python>python practice.py
sum = 60
```

4. Write a program to add two numbers and return the result using function.

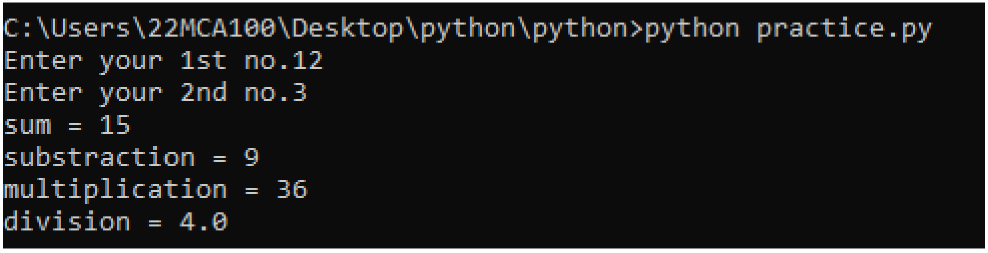
```
def sum(a,b):
        return "sum =",(a+b)

print(sum(10,34))
```



```
:\Users\22MCA100\Desktop\python\python>python practice.py
('sum =', 44)
```

5. Write a program to add, subtract, multiply and divide two numbers and print the result.

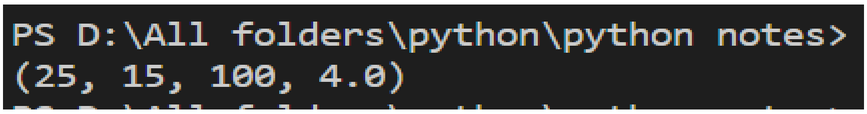
```
a=int(input("Enter your 1st no."))
b=int(input("Enter your 2nd no."))
c=a+b
d=a-b
e=a*b
f=a/b

print("sum =",c)
print("substraction =",d)
print("multiplication =",e)
print("division =",f)
```



```
C:\Users\22MCA100\Desktop\python\python>python practice.py
Enter your 1st no.12
Enter your 2nd no.3
sum = 15
substraction = 9
multiplication = 36
division = 4.0
```

6. Write a program to add, subtract, multiply and divide two numbers using function and return the result.

```
def cal(a,b):
   sum=a+b
   sub=a-b
   mul=a*b
   div=a/b
   return sum,sub,mul,div
print(cal(20,5))
```

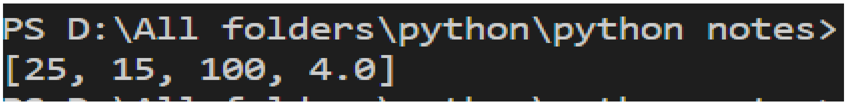


```
PS D:\All folders\python\python notes>
(25, 15, 100, 4.0)
```

Assignment 2:

1.Write a function to add, subtract, multiply and divide two numbers using function and return the result in list.

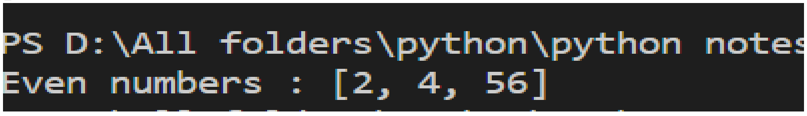
```
def cal(a,b):
    res=[]
    sum=a+b
    sub=a-b
    mul=a*b
    div=a/b
    res=sum,sub,mul,div
    return res
print(list(cal(20,5)))
```



```
PS D:\All folders\python\python notes>
[25, 15, 100, 4.0]
```

2. Write a function to find even numbers and return a list.

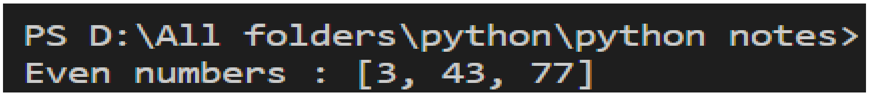
```
def even(lst):
    l=[]
    for i in lst:
        if i%2==0:
            l.append(i)
    return l

print("Even numbers :",even([2,4,3,56,43,77]))
```



```
PS D:\All folders\python\python notes
Even numbers : [2, 4, 56]
```

3. Write a function to find odd numbers and return a list.

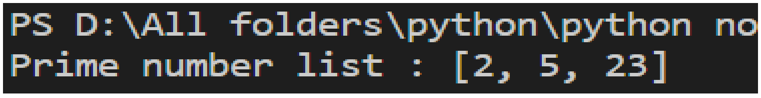
```
def even(lst):
    l=[]
    for i in lst:
        if i%2==1:
            l.append(i)
    return l

print("Even numbers :",even([2,4,3,56,43,77]))
```



```
PS D:\All folders\python\python notes>
Even numbers : [3, 43, 77]
```

4. Write a function to find prime numbers and return a list.

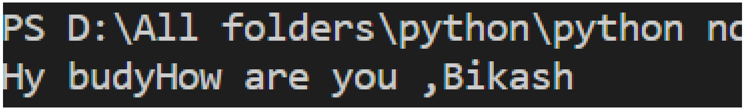
```
def max(lst):
  l=[]
  for i in lst:
    if i==0 or i==1:
      continue
    for j in range(2,i//2+1):
      if i%j==0:
        break
    else:
      l.append(i)
  if len(l):
    print("Prime number list :",l)
  else:
    print("No prime number in the list .")

max([1,2,5,23,22])
```



```
PS D:\All folders\python\python no
Prime number list : [2, 5, 23]
```

5. Write a function inside another function.

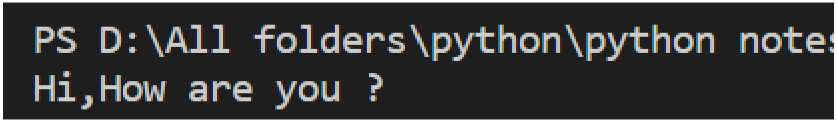
```
def fun(s):
  def fun1():
    return "Hy budy"
  return fun1()+"How are you ,"+s

print(fun("Bikash"))
```



```
PS D:\All folders\python\python no
Hy budyHow are you ,Bikash
```

6. Write a program to pass function as a parameter. Hint write a function, which returns a string 'How are you?' Pass this function, as a parameter to another function that print Hi, How are you

```
def fun(fun):
    def fun1():
        return "How are you ?"
    return fun+","+fun1()

print(fun("Hi"))
```

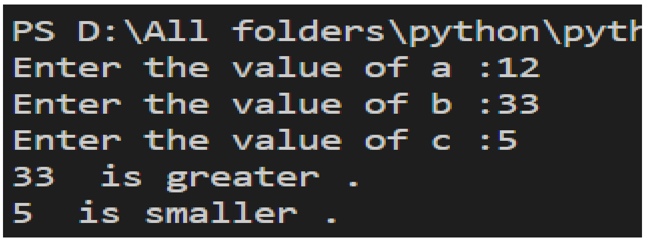


```
PS D:\All folders\python\python notes
Hi,How are you ?
```

Assignment:3

1.Write a Python function to find the maximum of three numbers.

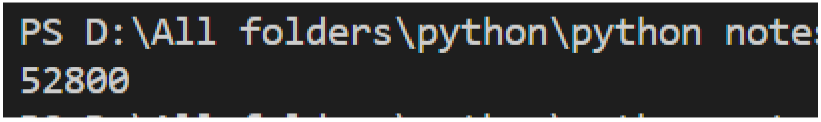
```
def find(a,b,c):
    if a>b and a>c:
        print(a,"a is greater .")
        if b>c:
            print(c," is smaller .")
        else:
            print(a," is smaller .")
    elif b>c and b>a:
        print(b," is greater .")
        if a>c:
            print(c," is smaller .")
        else:
            print(a," is smaller .")
    elif c>a and c>b:
        print(c," is greater .")
        if b>a:
            print(a," is smaller .")
        else:
            print(b," is smaller .")
    else :
        print("all are same .")

a=int(input("Enter the value of a :"))
b=int(input("Enter the value of b :"))
c=int(input("Enter the value of c :"))
find(a,b,c)
```



```
PS D:\All folders\python\pyth
Enter the value of a :12
Enter the value of b :33
Enter the value of c :5
33  is greater .
5  is smaller .
```

2. Write a Python function to multiply all the numbers in a list. (Numbers can be negative, positive or zero)

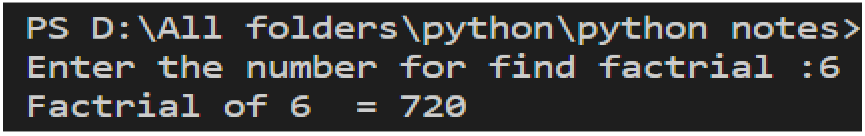
```
def fun(lst):
    mul=1
    for i in lst:
        mul=mul*i
    return mul

print(fun([10,22,3,16,5]))
```



```
PS D:\All folders\python\python notes
52800
```

3. Write a Python function to calculate the factorial of a number. The function accepts the number as an argument.

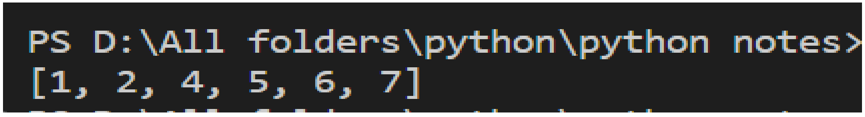
```
def fun(n):
    mul=1
    for i in range(1,n+1):
        mul=mul*i
    return mul

n=int(input("Enter the number for find factrial :"))
print("Factrial of",n," =",fun(n))
```



```
PS D:\All folders\python\python notes>
Enter the number for find factrial :6
Factrial of 6  = 720
```

4. Write a Python function that takes a list and returns a new list with distinct elements from the first list

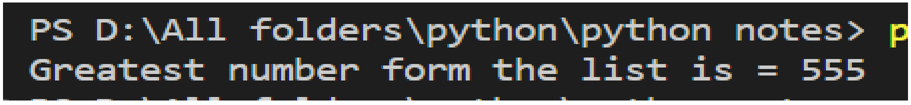
```
def unique(lst):
    l=[]
    for i in lst:
        if i not in l:
            l.append(i)
    return l
print(unique([1,2,2,4,5,5,1,6,7,7]))
```



```
PS D:\All folders\python\python notes>
[1, 2, 4, 5, 6, 7]
```

5. Write a python function to find the largest item from a given list.

```
def max(lst):
    a=lst[0]
    for i in range(len(lst)):
        if lst[i]>a:
            a=lst[i]
    return a
print("Greatest number form the list is =",max([1,2,2,4,5,555,1,6,7,77]))
```

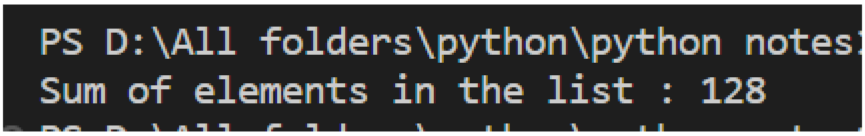


```
PS D:\All folders\python\python notes> p
Greatest number form the list is = 555
```

Assignment:4

1.Write a function to add up all the numbers in a list.

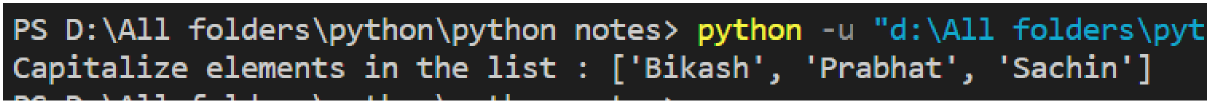
```
def sum(lst):
    sum=0
    for i in lst:
        sum=sum+i
    return sum
print("Sum of elements in the list :",sum([23,10,45,50]))
```



```
PS D:\All folders\python\python notes:
Sum of elements in the list : 128
```

2. Write a function takes a list of strings and returns a new list that contains capitalized strings.

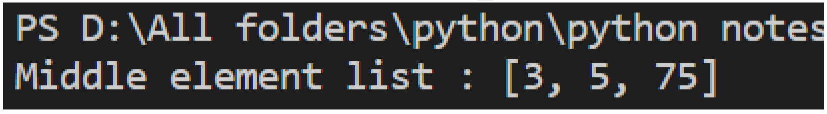
```
def capatalize(lst):
    l=[]
    for i in lst:
        l.append(i.capitalize())
    return l
print("Capitalize elements in the list :",capatalize(["bikash","prabhat","sachin"]))
```



```
PS D:\All folders\python\python notes> python -u "d:\All folders\pyt
Capitalize elements in the list : ['Bikash', 'Prabhat', 'Sachin']
```

3. Write a function called middle that takes a list and returns a new list that contains all but the first and last elements should be removed. So middle([1,2,3,4]) should return [2,3].

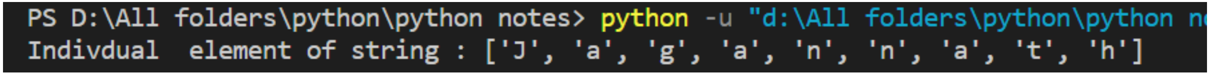
```
def remove_ele(lst):
    lst.pop(0)
    lst.pop(-1)
    return lst
print("Middle element list :",remove_ele([1,3,5,75,7]))
```



```
PS D:\All folders\python\python notes
Middle element list : [3, 5, 75]
```

4. Write a function which breaks a string into individual letters.

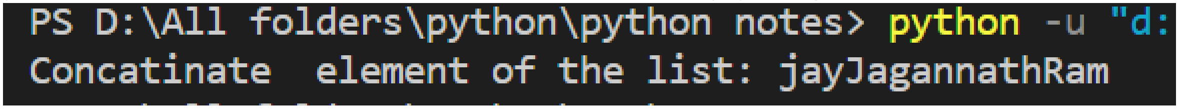
```
def indi(lst):
    l=[]
    for i in lst:
        l.append(i)
    return l

print("Indivdual  element of string :",indi("Jagannath"))
```



```
PS D:\All folders\python\python notes> python -u "d:\All folders\python\python n
Indivdual  element of string : ['J', 'a', 'g', 'a', 'n', 'n', 'a', 't', 'h']
```

5. Write a function which takes a list of strings and concatenates the elements.

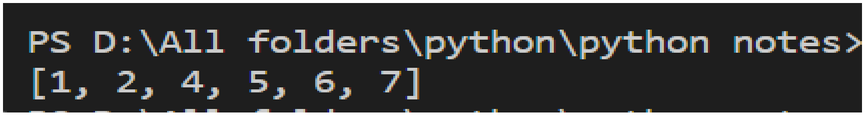
```
def concatinate(lst):
    sum=""
    for i in lst:
        sum=sum+i
    return sum

print("Concatinate  element of the list:",concatinate(["jay","Jagannath","Ram"]))
```



```
PS D:\All folders\python\python notes> python -u "d:
Concatinate  element of the list: jayJagannathRam
```

6. Write a function that takes a list and returns a new list with distinct elements from the first list

```
def unique(lst):
    l=[]
    for i in lst:
        if i not in l:
            l.append(i)
    return l
print(unique([1,2,2,4,5,5,1,6,7,7]))
```

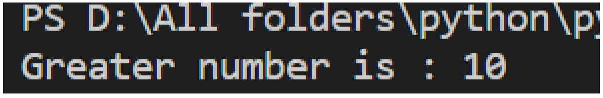


```
PS D:\All folders\python\python notes>
[1, 2, 4, 5, 6, 7]
```

Assignment 5:-

1. Write lambda function to find maximum value from two numbers.

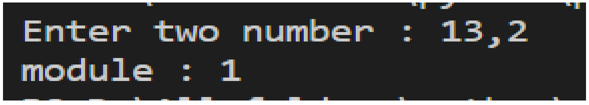
```
f=lambda a,b:a if a>b else b
max=f(10,5)
print("Greater number is :",max)
```



```
PS D:\All folders\python\py
Greater number is : 10
```

2. Write a lambda function to find modulo of given number.

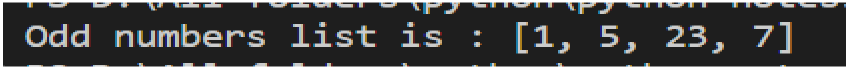
```
mode=lambda x,y:x%y
a,b=[int(n) for n in input("Enter two number : ").split(',')]
print("module :",mode(a,b))
```



```
Enter two number : 13,2
module : 1
```

3. Use filter to find odd values from a list. Use lambda function to Write function.

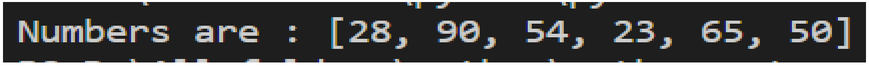
```
lst=[1,5,23,6,64,7,8]
odd=lambda x:True if x%2==1 else False
result=list(filter(odd,lst))
print("Odd numbers list is :",result)
```



```
Odd numbers list is : [1, 5, 23, 7]
```

4. Use filter function to find values greater than 10 and less than 500 function.

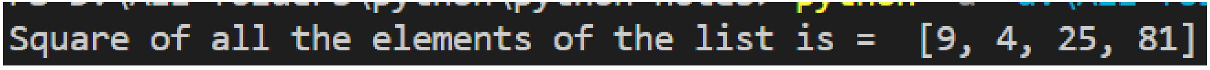
```
seq=[28,90,1,54,600,23,65,800,50]
f=filter(lambda x:True if x>10 and x<500 else False,seq)
print(list("Numbers are :",f))
```



```
Numbers are : [28, 90, 54, 23, 65, 50]
```

5. Use map to find square for each values of the list. Use lambda function to write function.

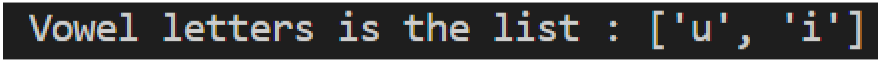
```
def sqr(n):
            return n*n
lst=[3,2,5,9]
#map(function,iterationList)
res=map(sqr,lst)
print("Square of all the elements of the list is = ",list(res))
```



```
Square of all the elements of the list is =  [9, 4, 25, 81]
```

6. Use filter function to extract vowels from given list of alphabets

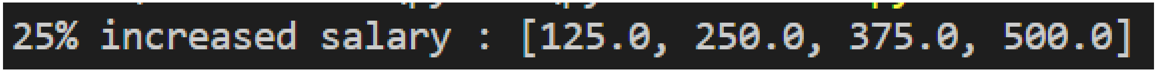
```
v=['a','e','i','o','u']
seq=['f','j','u','k','i']
vow=filter(lambda x: True if (x in v) else False,seq)
print("Vowel letters is the list :",list(vow))
```



```
Vowel letters is the list : ['u', 'i']
```

7. Use map function to increase salary by 25% of all employees.

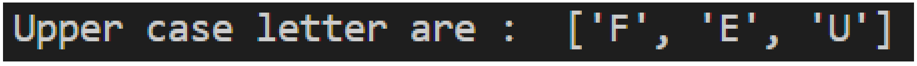
```
def sal(n):
        return (n+n*0.25)
se=[100,200,300,400]
x=map(sal,se)
print("25% increased salary :",list(x))
```



```
25% increased salary : [125.0, 250.0, 375.0, 500.0]
```

8. Write a Python program to convert all the characters into uppercase. Use map

```
def up(n):
        return n.upper()
lst=['f','e','u']
res=map(up,lst)
print("Upper case letter are : ",list(res))
```

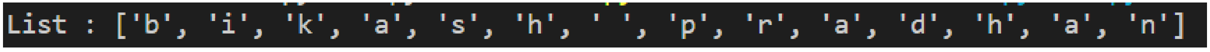


```
Upper case letter are :  ['F', 'E', 'U']
```

Assignment 6:-

1.Using List Comprehension to Iterate through a String.

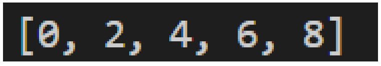
```
str="bikash pradhan"
lst=[i for i in str]
print("List :",lst)
```



```
List : ['b', 'i', 'k', 'a', 's', 'h', ' ', 'p', 'r', 'a', 'd', 'h', 'a', 'n']
```

2. Please check in the range from 0 – 9 if the item's value is divisible by 2.

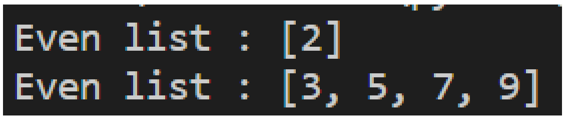
```
obj=[]
check=[i for i in range(10) if i%2==0 ]
print(list(check))
```



```
[0, 2, 4, 6, 8]
```

3. Check the five numbers from 0 to 9. If y is divisible by 2, then even is appended to the obj list.If not, odd is appended.

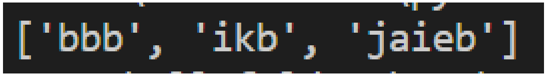
```
lst=[2,3,5,7,9]
obj=[]
odd=[]
for i in lst:
   if i%2==0:
      obj.append(i)
   else:
      odd.append(i)
print("Even list :",obj)
print("Even list :",odd)
```



```
Even list : [2]
Even list : [3, 5, 7, 9]
```

4. Finding the elements in a list in which elements are ended with the letter 'b' and the length of that element is greater than 2.

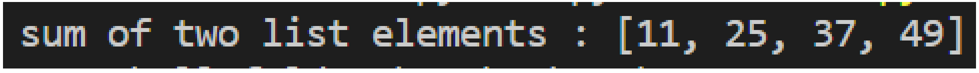
```
lst=["bik","bbb","ikb","iik","jaieb"]
k=[x for x in lst if x[-1]=="b" and len(x)>2]
print(k)
```



```
['bbb', 'ikb', 'jaieb']
```

5. Add two list X & Y and display the result.

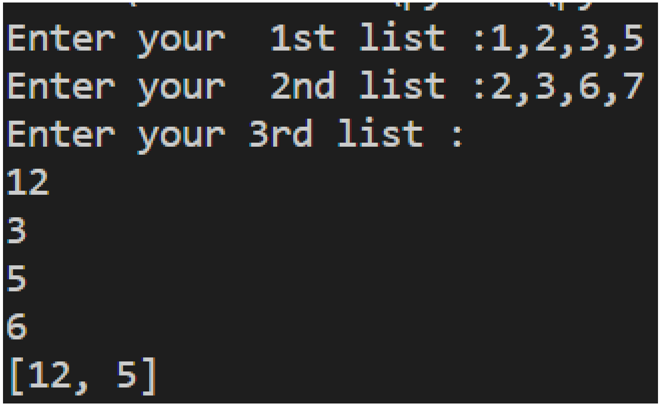
```
l=[1,2,3,5]
l1=[10,23,34,44]
l2=[] #3rd list
for i in range(len(l)):
   sum=l[i]+l1[i]  #sum of list elements
   l2.append(sum)
print("sum of two list elements :",l2)
```



```
sum of two list elements : [11, 25, 37, 49]
```

6. Lets take two list L1 & L2 with numbers and create another list L3 with numbers present in L1 but not in L2

```
l1=eval(input("Enter your  1st list :"))
l2=eval(input("Enter your  2nd list :"))
l3=[]
print("Enter your 3rd list :")
for i in range(len(l1)):
   n=int(input())
   if n in l2:
      continue
   else:
      l3.append(n)
print(l3)
```



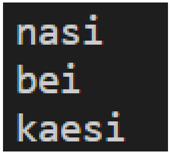
```
Enter your  1st list :1,2,3,5
Enter your  2nd list :2,3,6,7
Enter your 3rd list :
12
3
5
6
[12, 5]
```

Assignment 7:-

1)Write a python program to create a dictionary with the employee details and retrieve the value upon giving the keys.

```
emp={1:"nasi",2:"bei",5:"kaesi"}
```

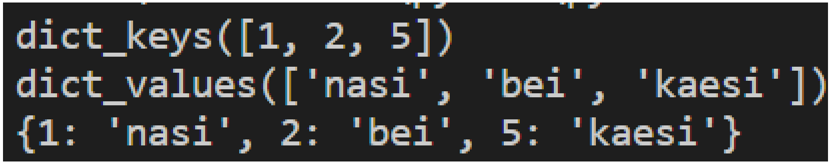
```
        print(emp[1])
        print(emp[2])
        print(emp[5])
```



```
nasi
bei
kaesi
```

2) Write a python program to retrieve keys, values and key-value pair from a dictionary.

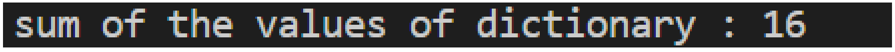
```
emp={1:"nasi",2:"bei",5:"kaesi"}
print(emp.keys())
print(emp.values())
print(emp)
```



```
dict_keys([1, 2, 5])
dict_values(['nasi', 'bei', 'kaesi'])
{1: 'nasi', 2: 'bei', 5: 'kaesi'}
```

3) Write a python program to create a dictionary and find the sum of values.(Use eval & sinput method).

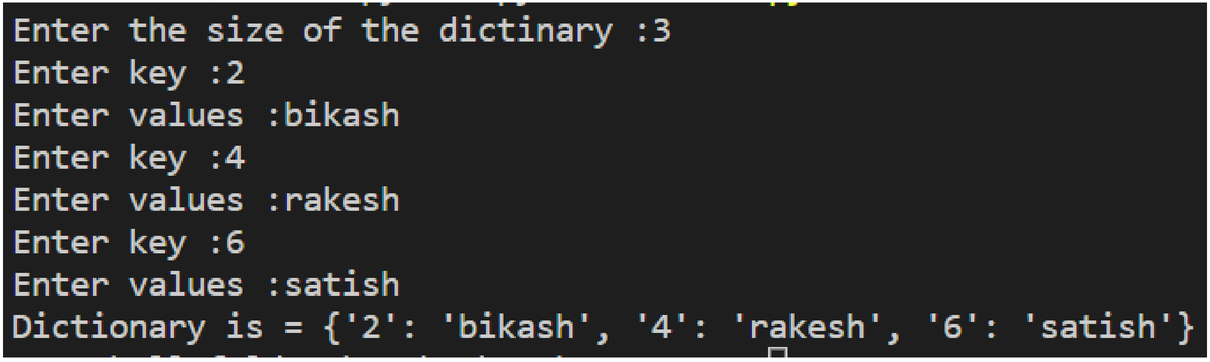
```
dic={"A":1,"h":5,"t":10}
sum=0
for i in dic.values():
        sum+=i
print("sum of the values of dictionary :",sum)
```



```
sum of the values of dictionary : 16
```

4) Write a python program to create a dictionary from keyboard and display the elements.

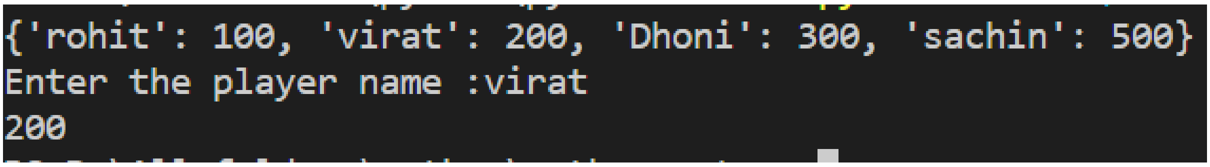
```
dic={}
n=int(input("Enter the size of the dictinary :"))
for i in range(n):
        key=input("Enter key :")
        val=input("Enter values :")
        dic.update({key:val})
print("Dictionary is =",dic)
```



```
Enter the size of the dictinary :3
Enter key :2
Enter values :bikash
Enter key :4
Enter values :rakesh
Enter key :6
Enter values :satish
Dictionary is = {'2': 'bikash', '4': 'rakesh', '6': 'satish'}
```

5) Write a python program to create a dictionary with cricket player's names and scores in a match.Also we are retrieving runs by entering the player's name.

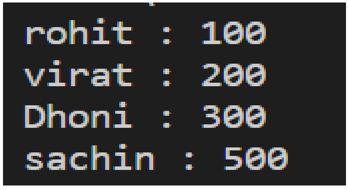
```
cir={"rohit":100,"virat":200,"Dhoni":300,"sachin":500}
print(cir)
x=input("Enter the player name :")
print(cir[x])
```



```
{'rohit': 100, 'virat': 200, 'Dhoni': 300, 'sachin': 500}
Enter the player name :virat
200
```

6) Write a python program to show the usage of for loop to retrieve elements of dictionaries.

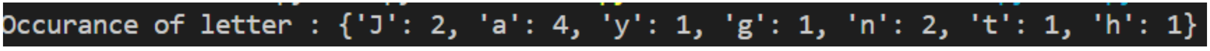
```
cir={"rohit":100,"virat":200,"Dhoni":300,"sachin":500}
for i in cir:
        print(i,":",cir[i])
```



```
rohit : 100
virat : 200
Dhoni : 300
sachin : 500
```

7) Write a python program to find the number of occurrences of each letter in a string using Dictionary

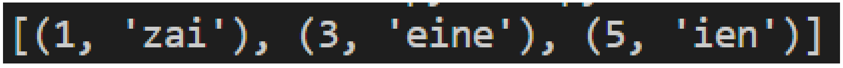
```
var="JayJagannath"
dic={}
for i in var:
        key=i
        val=var.count(i)
        dic.update({key:val})
print("Occurance of letter :",dic)
```



```
Occurance of letter : {'J': 2, 'a': 4, 'y': 1, 'g': 1, 'n': 2, 't': 1, 'h': 1}
```

8) Write a python program to sort the elements of a dictionary based on a key or values.(use lambda function)

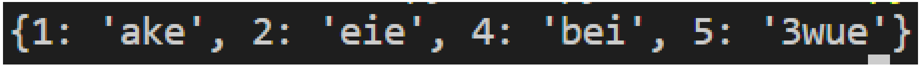
```
dic={1:"zai",3:"eine",5:"ien"}
key=lambda i:dic.keys()
dict_sort=sorted(dic.items(),key=lambda x:x[0])
print(dict_sort)
```



```
[(1, 'zai'), (3, 'eine'), (5, 'ien')]
```

9) Write a python program to convert the elements of two lists into key-value pairs of dictionary.

```
l1=[1,2,4,5]
l2=['ake','eie','bei','3wue']
dic={}
for i in range(len(l1)):
        key=l1[i]
        val=l2[i]
        dic.update({key:val})
print(dic)
```

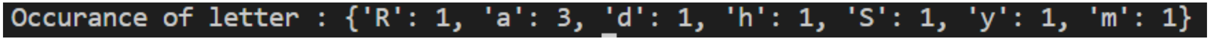


```
{1: 'ake', 2: 'eie', 4: 'bei', 5: '3wue'}
```

10) Write a python program to convert string into key value pair and store them into a dictionary

```
var="RadhaSyam"
```

```
dic={}
for i in var:
        key=i
        val=var.count(i)
        dic.update({key:val})
print("Occurance of letter :",dic)
```

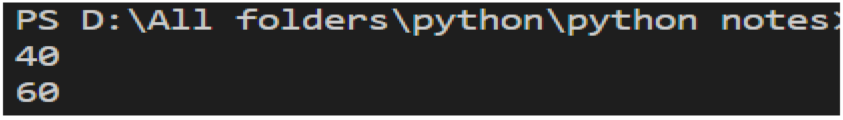


```
Occurance of letter : {'R': 1, 'a': 3, 'd': 1, 'h': 1, 'S': 1, 'y': 1, 'm': 1}
```

Assignment 8:-

1.Write a function to return an integer, write one decorator to increment the value by returned by function, write another decorator to multiply the value by 2. Print the results, then change the order of decorator applied and print the result.

```
def decor(fun):
        def inner():
                val=fun()
                return val+10
        return inner
def decor1(fun):
        def inner():
                val=fun()
                return val*2
        return inner

def num():
        return 30
#@decor
#@decor1

result1=decor(num)
result2=decor1(num)
print(result1())
print(result2())
```



```
PS D:\All folders\python\python notes
40
60
```

2. Define a module containing math functions like a. Add b. Subtract c. Multiply d. Divide Create a module to create a decor to print name of the math function, import math and decor in third file to use the function defined in math module and print name using decor module.

Math.py

```
def Add(*args):
        total=0
        for i in args:
                total += i
        print("Add : ",total)
def Subtract(*args):
        total=0
        for i in args:
```

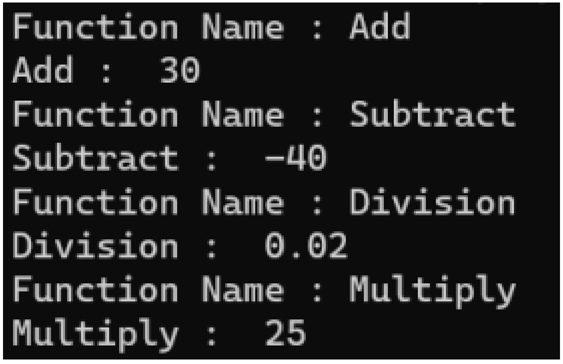
```
        total -= i
    print("Subtract : ",total)
def Multiply(*args):
    total=1
    for i in args:
        total *= i
    print("Multiply : ",total)
def Division(*args):
    total=1
    for i in args:
        total /= i
    print("Division : ",total)
```

Decor.py

```
from Math import *
def func_name(func):
def wrapper(*args):
    print("Function Name : "+func.__name__)
    func(*args)
return wrapper
```

Result.py

```
import Math
import Decor
e = func_name(Add)
f= func_name(Subtract)
g= func_name(Multiply)
h= func_name(Division)
e(10,20)
f(10,30)
h(10,5)
g(5,5)
```



```
Function Name : Add
Add :  30
Function Name : Subtract
Subtract :  -40
Function Name : Division
Division :  0.02
Function Name : Multiply
Multiply :  25
```

3. Define a module geometric containing functions to calculate area of a. Square b. Rectangle c. Circle d. Triangle e. IsSquare Create a module to create a decor to print name of the Geometirc function, import Geometirc and decor in third file to use the function defined in Geometirc module and print name using decor module.

Geom.py

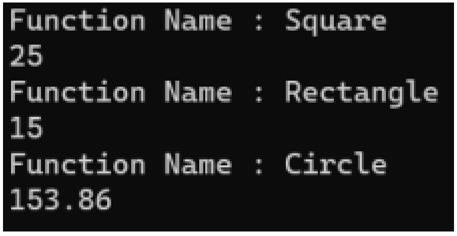
```
def Square(r):
    print(r*r)
def Rectangle(h,w):
        print(h*w)
def Circle(r):
        print(3.14*r*r)
def Triangle(h,b):
        print(h*b/2)
def IsSquare():
        print("True")
```

Decor.py

```
from Geom import *
def func_name(func):
        def wrapper(*args):
                print("Function Name : "+func.__name__)
        func(*args)
return wrapper
```

Area.py

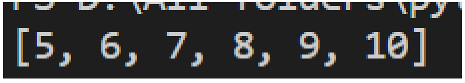
```
import Geom
import Decor
s = func_name(Square)
r = func_name(Rectangle)
c = func_name(Circle)
s(5)
r(5,3)
c(7)
```



```
Function Name : Square
25
Function Name : Rectangle
15
Function Name : Circle
153.86
```

4. Write a generator to returns a sequence in given range (Hint. values between x and y say 5 and 10)

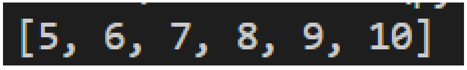
```
def rang(x,y):
        while x<=y:
                yield x
                x+=1
g=rang(5,10)
lis=[]
for i in g:
        lis.append(i)
print(lis)
```



```
PS D:\All Folders\py
[5, 6, 7, 8, 9, 10]
```

5. Write generator to returns a sequence in given range (Hint. values between x and y say 10 and 1)

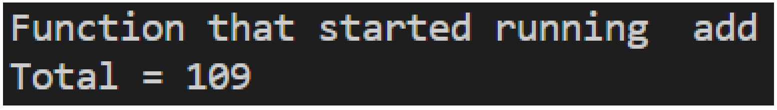
```
def fun(a,b):
        while a>b:
                yield a
                a-=1
val=fun(10,1)
l=[]
for i in val:
        l.append(i)
print(l)
```



```
[5, 6, 7, 8, 9, 10]
```

6. Write a program to display the source of execution of a program using name variable.

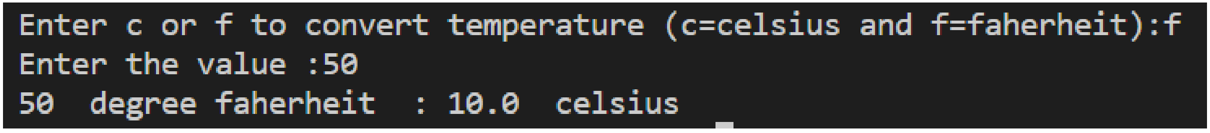
```
def fun(func):
        def wrapper(*args):
                print("Function that started running ",func.__name__)
                func(*args)
        return wrapper
def add(*args):
        sum=0
        for i in args:
                sum+=i
        print("Total =",sum)
k=fun(add)
k(20,34,55)
```



```
Function that started running  add
Total = 109
```

9.write a python program to convert celsius to Fahrenheit and vice-a-versa.

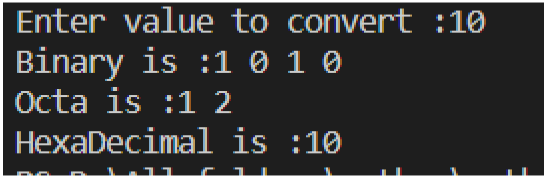
```
def c_f(cel):
  fer=(1.8*cel)+32
  return fer
def f_c(fer):
  cel=(fer-32)/1.8
  return cel

ch=input("Enter c or f to convert temperature (c=celsius and f=faherheit):")
val=int(input("Enter the value :"))
if ch=='f':
  print(val," degree faherheit  :",f_c(val)," celsius ")
elif ch=='c':
  print(val,"degree celsius  :",c_f(val)," faherheit")
else:
  print("Invalid input! ")
```



```
Enter c or f to convert temperature (c=celsius and f=faherheit):f
Enter the value :50
50  degree faherheit  : 10.0  celsius
```

10.Write a Program to Convert Decimal to Binay ,Octal,Hexadecimal.

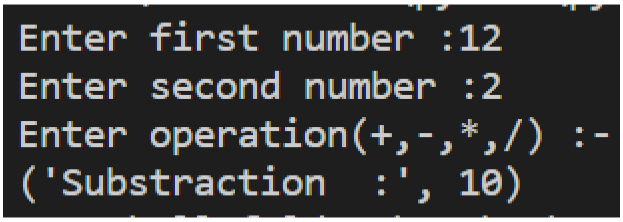
```
def de_by(val,x):
  l=[]
  while(val!=0):
        rem=val%x
        l.append(rem)
        val=val//x
    l.reverse()
    for i in l:
        print(i,end=" ")


a=int(input("Enter value to convert :"))
print("Binary is :",end="")
de_by(a,2)
print("\nOcta is :",end="")
de_by(a,8)
print("\nHexaDecimal is :",end="")
de_by(a,16)
```



```
Enter value to convert :10
Binary is :1 0 1 0
Octa is :1 2
HexaDecimal is :10
```

11.Write a program to make a simple calculator (using funcion).

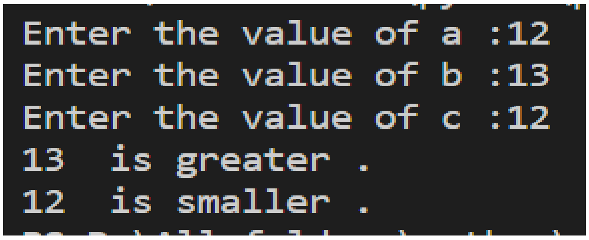
```
def add(a,b):
    return "Addition :",(a+b)
def sub(a,b):
    return "Substraction  :",(a-b)
def mul(a,b):
    return "Multiplication :",(a*b)
def div(a,b):
    return "Divison:",(a/b)



a=int(input("Enter first number :"))
b=int(input("Enter second number :"))
x=input("Enter operation(+,-,*,/) :")
if x=="+":
    print(add(a,b))
elif x=="-":
    print(sub(a,b))
elif x=="*":
    print(mul(a,b))
elif x=="/":
    print(div(a,b))
else:
    print("Enter valid input !")
```



```
Enter first number :12
Enter second number :2
Enter operation(+,-,*,/) :-
('Substraction  :', 10)
```

12.Write a program in python to find the maximun and minimun numbers oout of threee use-entered numbers .

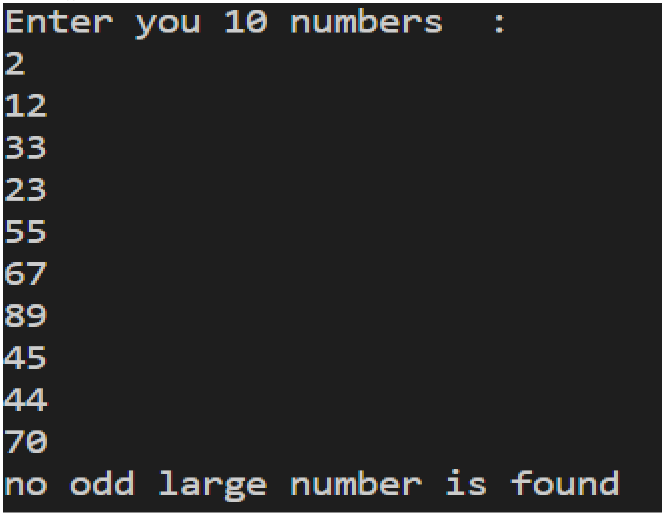
```
def find(a,b,c):
    if a>b and a>c:
        print(a,"a is greater .")
        if b>c:
            print(c," is smaller .")
        else:
            print(a," is smaller .")
    elif b>c and b>a:
        print(b," is greater .")
        if a>c:
            print(c," is smaller .")
        else:
            print(a," is smaller .")
    elif c>a and c>b:
        print(c," is greater .")
        if b>a:
            print(a," is smaller .")
        else:
            print(b," is smaller .")
    else :
        print("all are same .")

a=int(input("Enter the value of a :"))
b=int(input("Enter the value of b :"))
c=int(input("Enter the value of c :"))
find(a,b,c)
```



```
Enter the value of a :12
Enter the value of b :13
Enter the value of c :12
13  is greater .
12  is smaller .
```

13.Write a program that will allow the user to enter 10 numbers and display the largest odd number from them.It will display an appropriate message in case.no odd number is found.

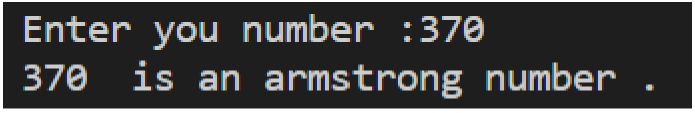
```
def odd():
  print("Enter you 10 numbers  :")
  l=[]
  l2=[]
  for i in range(1,11):
    x=int(input())
    l.append(x)
  for i in l:
        if i%2==1:
            l2.append(i)
            print("Odd and lagrest number  :",max(l2))
            break
        else:
            print("no odd large number is found ")
            break

 odd()
```



```
Enter you 10 numbers   :
2
12
33
23
55
67
89
45
44
70
no odd large number is found
```

14.Write a python program to check if the number is Amstrong number .

```
x=int(input("Enter you number :"))
lst=str(x)

sum=0
for i in lst:
    sum+=int(i)**len(lst)

if sum==x:
    print( x," is an armstrong number .")
else:
    print( x," is not armstrong number .")
```



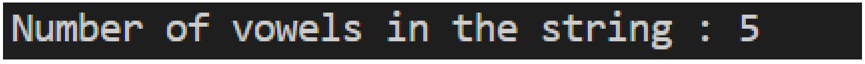
```
 Enter you number :370
 370  is an armstrong number .
```

15.Write a Python program to perform the following operation on give string input :

a)Count Number of Vowel in a given string

```
def vowel(lst):
    l=["a","e","i","o","u"]
    count=0
    for i in lst:
        if i.lower() in l:
            count+=1
    return count
```

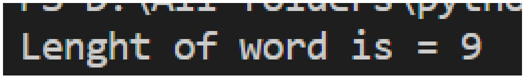
```
print("Number of vowels in the string :",vowel("Kaushitamam"))
```



```
Number of vowels in the string : 5
```

b)Count Length of String(do not use len())

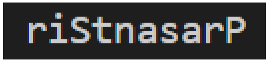
```
def length(s):
    count=0
    for i in s:
        count+=1
    return count
print("Lenght of word is =",length("Jayanamam"))
```



```
Lenght of word is = 9
```

c)Reverse String

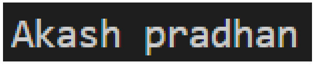
```
print("PrasantSir"[::-1])
```



```
riStnasarP
```

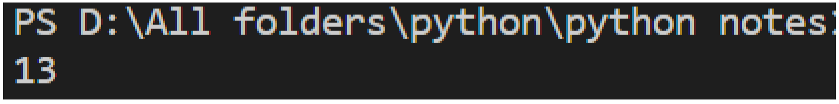
d)Find and Replace operation

```
l="Bikash pradhan"
x=l.replace("Bikash","Akash")
print(x)
```



```
Akash pradhan
```

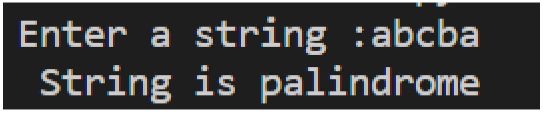
```
l="Hy , My name is Bikash Pradhan "
print(l.find("is"))
```



```
PS D:\All folders\python\python notes
13
```

e)Check whether Stirng entered is a palindrom or not :

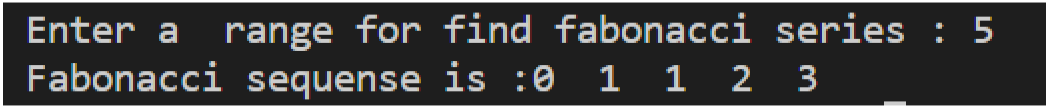
```
s=str(input("Enter a string :"))
rev=s[::-1]
if s==rev:
    print(" String is palindrome ")
else:
    print("String is not a palindrome ")
```



```
Enter a string :abcba
 String is palindrome
```

16.Write a program in python to implement the Fibonnacci series up to user enterd number.(use recursive function).

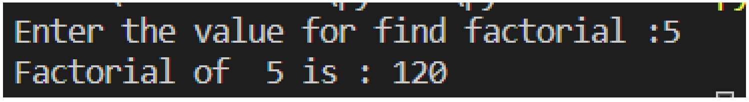
```
def fab(n):
    if n<=1:
        return n
    else:
        return(fab(n-1)+fab(n-2))
x=int(input("Enter a  range for find fabonacci series : "))
if x<=0:
    print("Enter a positive number !")
else:
    print("Fabonacci sequense is :",end="")
    for i in range(x):
        print(fab(i)," ",end="")
```



```
Enter a  range for find fabonacci series : 5
Fabonacci sequense is :0  1  1  2  3
```

17.Write a program in python to implement the Factorial series up to user-enterd number.(use recursive function).

```
def fun(n):
    if n==0:
        return 1
    return n*fun(n-1)

val=int(input("Enter the value for find factorial :"))
print("Factorial of ",val,"is :",fun(val))
```

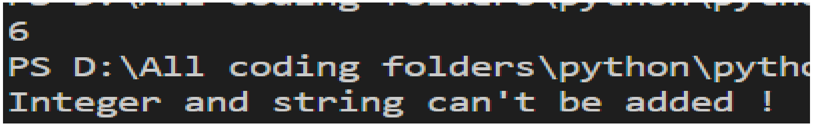


```
Enter the value for find factorial :5
Factorial of  5 is : 120
```

Assignment 9:

1. Write a program to generate TypeError Exception and handle it.

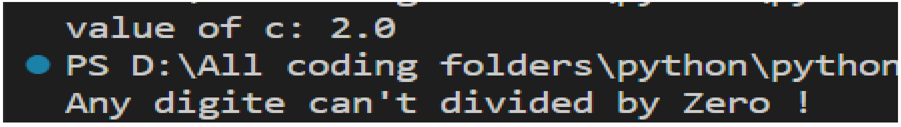
```
x=1
y='hello'
try:
   result=x+y
   print(result)
except TypeError :
   print("Integer and string can't be added !")
```



```
6
PS D:\All coding folders\python\pytho
Integer and string can't be added !
```

2. Write a program to generate ZeroDivisionError Exception and handle it.

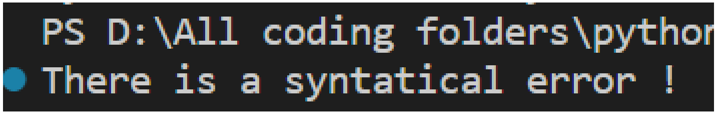
```
a=10
b=0
try:
   c=a/b
   print("value of c:",c)
except ZeroDivisionError:
   print("Any digite can't divided by Zero !")
```



```
  value of c: 2.0
● PS D:\All coding folders\python\python
  Any digite can't divided by Zero !
```

3. Write a program to generate SyntaxError Exception and handle it.

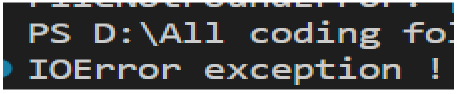
```
try:
   eval("x===x")
except SyntaxError:
   print("There is a syntatical error !")
```



```
  PS D:\All coding folders\pythor
● There is a syntatical error !
```

4. Write a program to generate IOError Exception and handle it.

```
try:
   f=open("P9.txt","r")
   content=f.readline()
   f.close
except IOError:
   print("IOError exception !")
```

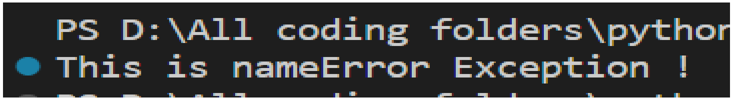


```
 PS D:\All coding fo
 IOError exception !
```

5. Write a program to generate NameError Exception and handle it.

```
try:
   name="Kausika pal mam"
```

```
    print(nam)
except NameError:
    print("This is nameError Exception ! ")
```

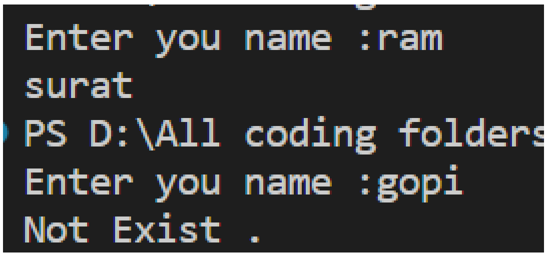


```
PS D:\All coding folders\pytho
This is nameError Exception !
```

Assignment 10:-

1.Write a program to find city of given person, have some user with their city in dictionary, the user will enter name to find his/her city, the program should print name of the city and if the user is not found it should use user-defined exception and give message that the user doesn't exist.

```
class Myexc(Exception):
    pass

persion_det={'ram':'surat','syam':'ahemdabad','rakesh':'bhubneswar'}
person_name=input("Enter you name :")
try:

if person_name.lower() in persion_det:
        print(persion_det[person_name.lower()])
else:
        raise Myexc("Not Exist .")

except Myexc as e:
print(e)
```

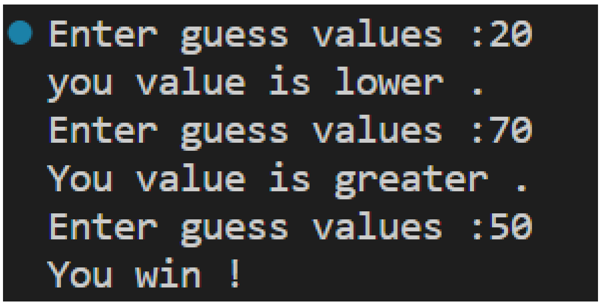


```
Enter you name :ram
surat
PS D:\All coding folders
Enter you name :gopi
Not Exist .
```

2. Write a program to enter a specific number say n, the program should not terminate until user enters specific number n. It should generate exception Too SmallValue if the value < n and generate exception TooLargeValue if value > n.

```
class Myexception(Exception):
        pass

n=50
while(True):
        guess=int(input("Enter guess values :"))
        try:
                if(guess==n):
```

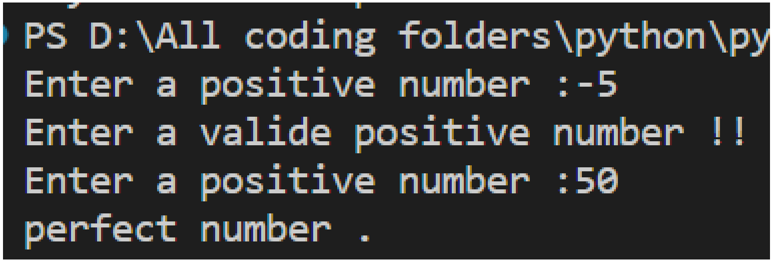
```
            print("You win !")
            break
        elif(guess>=n):
            raise Myexception("You value is greater .")
        else:
            raise Myexception("you value is lower .")

    except Myexception as e:
        print(e)
```



```
Enter guess values :20
you value is lower .
Enter guess values :70
You value is greater .
Enter guess values :50
You win !
```

3.Write a program to accept positive digit. Define a user-defined exception to check whether the value given is a valid positive digit or not. If the value is not numeric the exception Not_Suitable_value_exceptions should be triggered and handled.

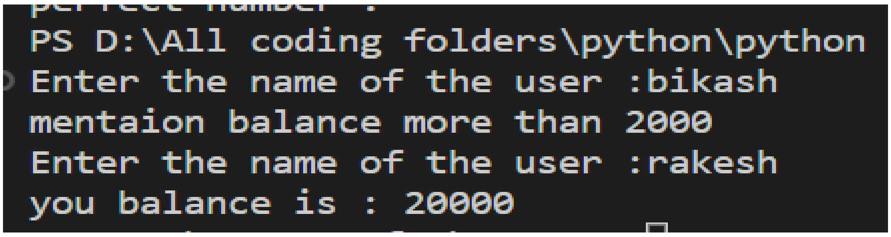
```
class Myexc(Exception):
    pass

while(True):
    try:
        n=int(input("Enter a positive number :"))
        if(n>=0):
            print("perfect number .")
            break
        else:
            raise Myexc("Enter a valide positive number !!")

    except Myexc as e:
        print(e)
    except ValueError:
        print("Not_Suitable_value")
```



```
PS D:\All coding folders\python\py
Enter a positive number :-5
Enter a valide positive number !!
Enter a positive number :50
perfect number .
```

4. Write a user-defined exception to generate message if the balance of the given user is less than 2000INR in his bank account. Use dictionary to maintain account data with username and balance.

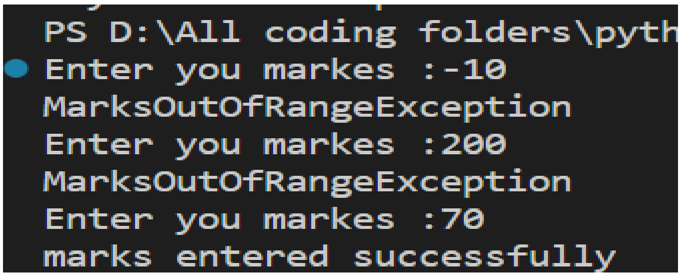
```
class Myexception(Exception):
pass

dic={"rakesh":20000,'gopi':3000,'pratik':4000,'bikash':1000}
while(True):
name=input("Enter the name of the user :")
try:
        if dic[name] <2000:
                raise Myexception("mentaion balance more than 2000")
        else:
                print("you balance is :",dic[name])

except Myexception as e:
        print(e)
```



```
PS D:\All coding folders\python\python
Enter the name of the user :bikash
mentaion balance more than 2000
Enter the name of the user :rakesh
you balance is : 20000
```

5. Write a program, which accepts marks of a student (between 0 to 100) and checks whether it is within the range or not. If it is within the range then it displays “marks entered successfully”, if not then it throws the exception of user defined class “MarksOutOfRangeException” .

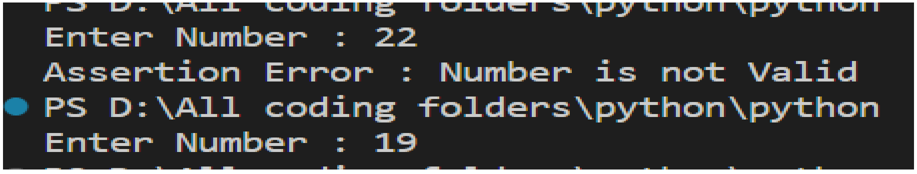
```
class Myexc(Exception):
  pass


while(True):
  try:
    marks=int(input("Enter you markes :"))
    if(marks>=0 and marks<=100 ):
      print("marks entered successfully")
      break
    else:
      raise Myexc("MarksOutOfRangeException")
  except Myexc as e:
    print(e)
```



```
PS D:\All coding folders\pyth
Enter you markes :-10
MarksOutOfRangeException
Enter you markes :200
MarksOutOfRangeException
Enter you markes :70
marks entered successfully
```

6. Write an assert statement to accept a value in range of 10 and 20.

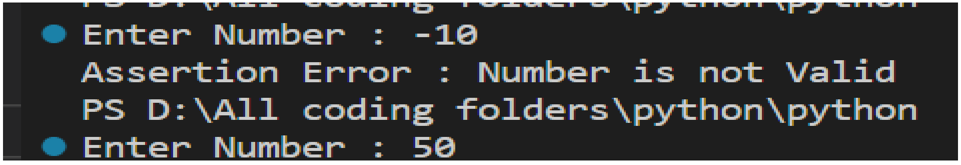
```
try:
   x= int(input("Enter Number : "))
   assert x>=10 and x<=20 , "Number is Valid."
except AssertionError:
            print("Assertion Error : Number is not Valid")
```



```
Enter Number : 22
Assertion Error : Number is not Valid
PS D:\All coding folders\python\python
Enter Number : 19
```

7. Write an assert statement to accept a positive number.

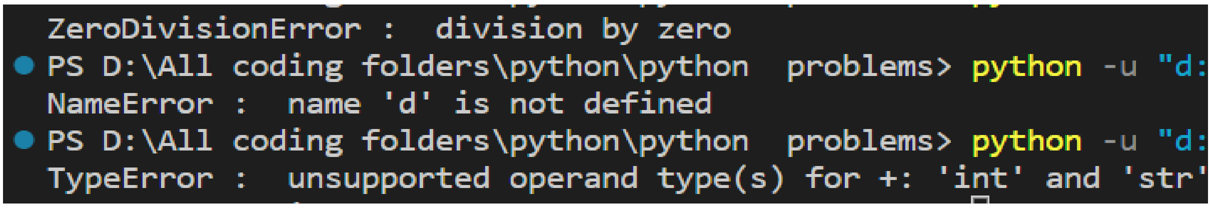
```
try:
   x= int(input("Enter Number : "))
   assert x>=0 , "Number is Valid."
except AssertionError:
            print("Assertion Error : Number is not Valid")
```



```
Enter Number : -10
Assertion Error : Number is not Valid
PS D:\All coding folders\python\python
Enter Number : 50
```

8. Write a program to generate TypeError, NameError, and ZeroDivision error and handle .

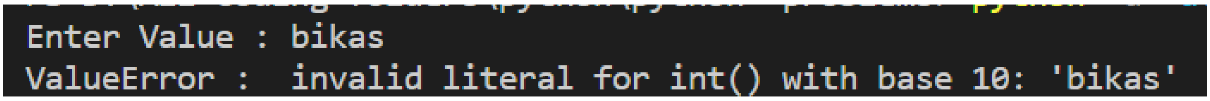
```
try:
   a=10
   # c=a/0
   # print(d)
   b = "hello"
   e = a+b

except ZeroDivisionError as e:
    print("ZeroDivisionError : ",e)
except NameError as e:
    print("NameError : ",e)
except TypeError as e:
    print("TypeError : ",e)
```



```
ZeroDivisionError :  division by zero
PS D:\All coding folders\python\python  problems> python -u "d:
NameError :  name 'd' is not defined
PS D:\All coding folders\python\python  problems> python -u "d:
TypeError :  unsupported operand type(s) for +: 'int' and 'str'
```

9.Write a program to generate and handle ValueError.

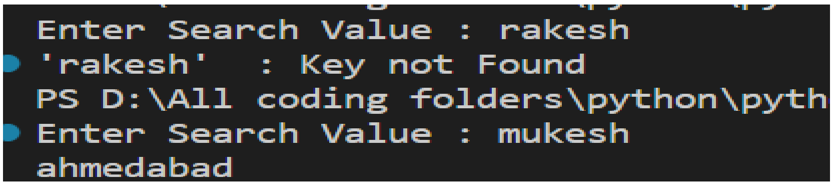
```
try:
   s = int(input("Enter Value : "))
   print(s)
except ValueError as e:
   print("ValueError : ",e)
```



```
Enter Value : bikas
ValueError :  invalid literal for int() with base 10: 'bikas'
```

10.Write a program to generate and handle KeyError.

```
dic = {"himansu":"surat","jagdis":"delhi","bimal":"varoda","mukesh":"ahmedabad"}
try:
   s = input("Enter Search Value : ")
   print(dic[s])
except KeyError as e:
           print(e," : Key not Found")
```

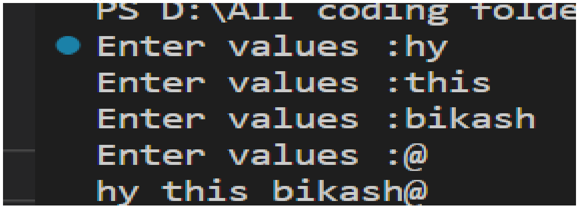


```
Enter Search Value : rakesh
'rakesh'  : Key not Found
PS D:\All coding folders\python\pyth
Enter Search Value : mukesh
ahmedabad
```

Assignment 11(file handling):

1. Write a program to open a file content.txt in write mode and write data, the file should take input until it finds @ character.

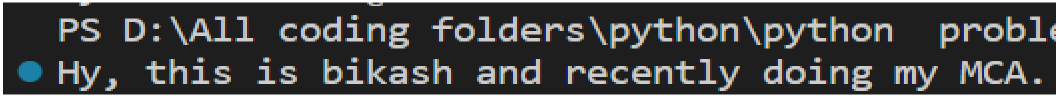
```
f=open("context.txt",'w')
x=" "
while x!="@":
   x=input("Enter values :")
   f.write(x)
f=open("context.txt",'r')
print(f.read())
f.close()
```



```
PS D:\All coding folde
Enter values :hy
Enter values :this
Enter values :bikash
Enter values :@
hy this bikash@
```

2. Write a program to open a file content.txt in read mode and read the content of the file.

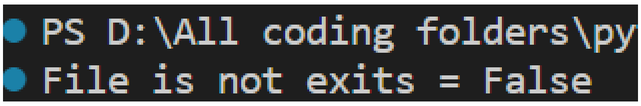
```
f=open("context.txt",'r')
print(f.read())
f.close()
```



```
PS D:\All coding folders\python\python  proble
Hy, this is bikash and recently doing my MCA.
```

3. Open and read a content of given file, check whether file exists or not, if file doesn’t exist give message. (Hint. Use os.path.isfile(filename) to check file existence).

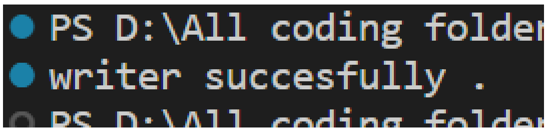
```
import os.path
path='./the.txt'
check_file=os.path.exists(path)
print("File is not exits =",check_file)
```



```
PS D:\All coding folders\py
File is not exits = False
```

4. Write a program to copy image in a new file. (Binary file).

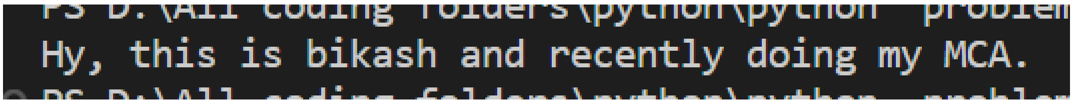
```
f1=open('xyz.jpg','rb')
f2=open("new.jpg",'wb')
x=f1.read()
f2.write(x)
print("writer succesfully .")
f1.close()
```



```
PS D:\All coding folde
writer succesfully .
PS D:\All coding folde
```

5. Read the content of the file. Use with method to open a file.

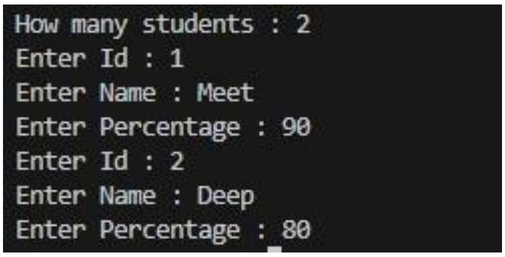
```
f=open('context.txt','r')
print(f.read())
f.close
```



```
PS D:\All coding folders\python\python  problem
Hy, this is bikash and recently doing my MCA.
PS D:\All coding folders\python\python  problem
```

6.Consider a student object with id, name, and percentage and create a class. Import this class and use pickle to dump several objects in a file named Student.dat. No. of objects should be taken as input.

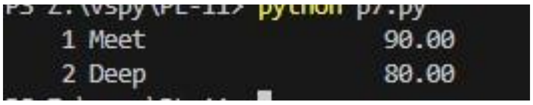
```
import student
Import pickel as p
f = open("Student.dat","wb")
n = int(input("How many students : "))
for i in range(n):
        sid = int(input("Enter Id : "))

        name = input("Enter Name : ")
            percentage = float(input("Enter Percentage : "))

            s = student.student(sid,name,percentage)

         p.dump(s,f)
f.close()
```



```
How many students : 2
Enter Id : 1
Enter Name : Meet
Enter Percentage : 90
Enter Id : 2
Enter Name : Deep
Enter Percentage : 80
```

7. Read content from Student.dat using pickle.

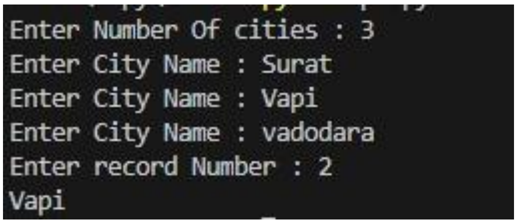
```
import student
import pickle as p

f = open("Student.dat","rb")
 while True:
try:
              obj = p.load(f)
             obj.display()
except Exception as e:
              break
f.close()
```



```
PS Z:\vspy\PL-11> python p7.py
    1 Meet                 90.00
    2 Deep                 80.00
```

8 .Write a program to search for city name in the binary file named cities.bin and display the record number that contains the city name.

```
recordLength = 20
with open("cities.bin","wb") as f:
             n = int(input("Enter Number Of cities : "))

for i in range(n):
city = input("Enter City Name : ")
l = len(city)
   city = city + (recordLength - l)*' '
l = len(city)
city = city.encode()
f.write(city)

reclen = 20
with open("cities.bin","rb") as f:
             n = int(input("Enter record Number : "))
f.seek(reclen*(n-1))
str = f.read(reclen)
             print(str.decode())
```

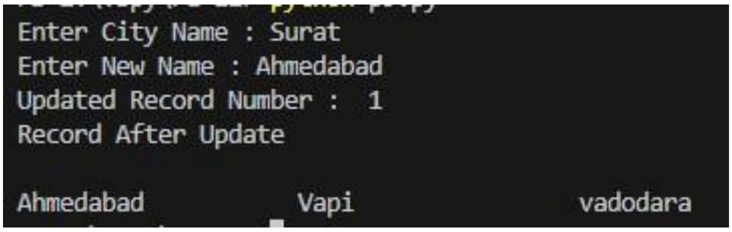


```
Enter Number Of cities : 3
Enter City Name : Surat
Enter City Name : Vapi
Enter City Name : vadodara
Enter record Number : 2
Vapi
```

9. Write a program to update or modify a record in a binary file(cities.bin).

```
import os
reclen = 20
```

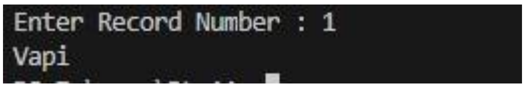
```
size =
os.path.getsize("cities.bi
n") n = int(size/reclen)

with open("cities.bin","r+b") as f:
          city = input("Enter City
Name : ")          city =
city.encode()
              newCity = input("Enter New Name : ")
          ln = len(newCity)
newCity = newCity + (20-
ln)*' '    newCity =
newCity.encode()
position = 0
            found = False

            for i in range(n):

f.seek(position)
          st =
f.read(20)
if city in st:
                                  print("Updated Record Number : ",(i+1))
                              found = True
                    f.seek(-20,1)
                               f.write(newCity)
                      position += reclen

           if not found:
                      print("City Not Found")

with open("cities.bin","r+b") as f:
           s = f.read()
            print("Record After Update\n")
           print(s.decode())
```



```
Enter City Name : Surat
Enter New Name : Ahmedabad
Updated Record Number :  1
Record After Update

Ahmedabad           Vapi                vadodara
```

11. Write a program to randomly access a record from a binary file(cities.bin).

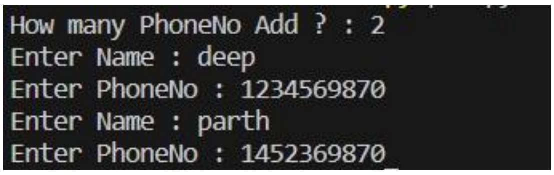
```
reclen = 20
with open("cities.bin","rb") as f:
    n = int(input("Enter Record Number
      : "))   f.seek(reclen * (n-1))     st =
      f.read(reclen)
     print(st.decode())
```



```
Enter Record Number : 1
Vapi
```

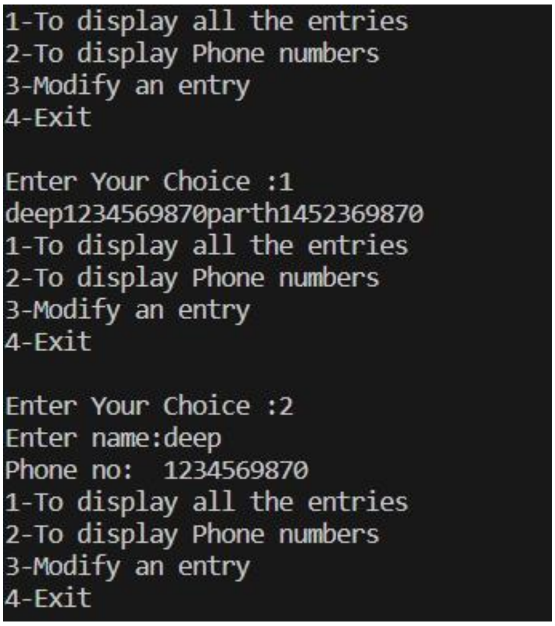
12.Write a program to create a phone book with names and phone numbers. Store data in binary file named Phonebook.dat.

```
with open("PhoneBook.dat","wb") as f:

        n= int(input("How many PhoneNo Add ? : "))

        for i in range(n):
                name = input("Enter Name : ")
                phoneno = input("Enter PhoneNo : ")

                name = name.encode()
                phoneno = phoneno.encode()

                f.write(name+phoneno)
```

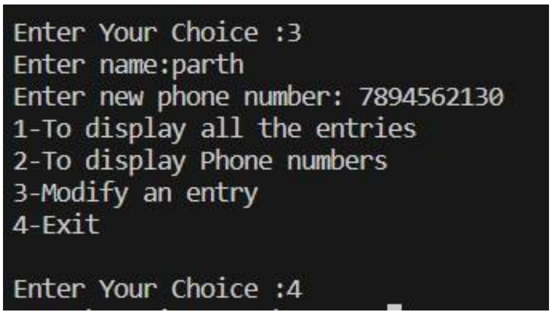


```
How many PhoneNo Add ? : 2
Enter Name : deep
Enter PhoneNo : 1234569870
Enter Name : parth
Enter PhoneNo : 1452369870_
```

```
import sys,mmap

while True:  print("1-To display all the entries\n2-To display Phone numbers\n3-Modify an entry\n4-
Exit")
ch = int(input("\nEnter Your Choice :"))


with open("phonebook.dat","r+b") as f:
        mm = mmap.mmap(f.fileno(), 0)
        if ch == 1:
                        print(mm.read().decode())
        elif ch == 2:
          name = input('Enter name:')
                n = mm.find(name.encode())
          n1 = n+len(name)
          ph = mm[n1: n1+10]
                print('Phone no: ', ph.decode())
        elif ch == 3:
          name = input('Enter name:')
          n = mm.find(name.encode())
    n1 = n+len(name)
    sys.exit()
        else:
    print("Invalid Choice.")
```



```
1-To display all the entries
2-To display Phone numbers
3-Modify an entry
4-Exit

Enter Your Choice :1
deep1234569870parth1452369870
1-To display all the entries
2-To display Phone numbers
3-Modify an entry
4-Exit

Enter Your Choice :2
Enter name:deep
Phone no:  1234569870
1-To display all the entries
2-To display Phone numbers
3-Modify an entry
4-Exit
```



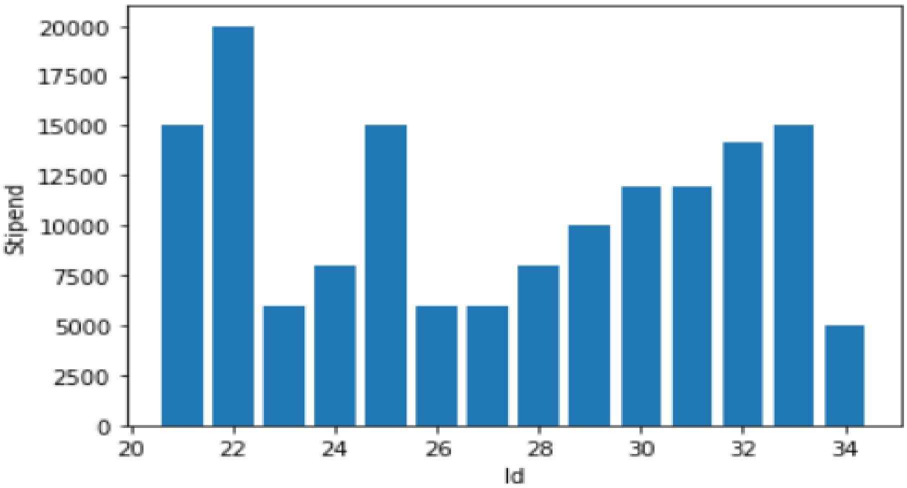
```
Enter Your Choice :3
Enter name:parth
Enter new phone number: 7894562130
1-To display all the entries
2-To display Phone numbers
3-Modify an entry
4-Exit

Enter Your Choice :4
```

Assignment -12(Data Science):

1. Consider data shown in table I in student.csv file, and write listed programs in python

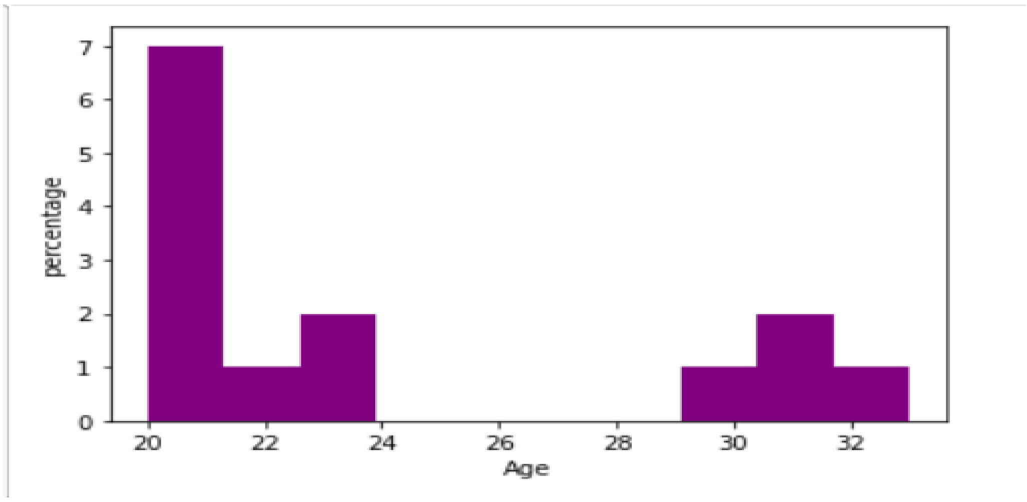
a. A program to display Id on X-axis and Stipend on Y-axis in the form of bar graph.

```
import pandas as pd
import matplotlib.pyplot as plt
df=pd.read_csv("student.csv")
plt.bar(df['Id'] ,df["Stipend"])
plt.xlabel('Id')
plt.ylabel('Stipend')
plt.show()
```



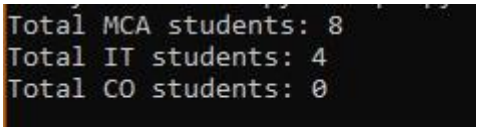
b. A program to display histogram showing the percentage of Students in specific age group.

```
import pandas as pd
import matplotlib.pyplot as plt
df=pd.read_csv("student.csv")
plt.hist(df['Age'],bins=10,color='purple')
plt.xlabel('Age')
plt.ylabel('percentage')
plt.show()
```



C .Write program to find total number of students in Branch MCA, IT and CO departments.

```
import pandas as pd
data = pd.read_csv("student.csv")

mca_students = data[data['Branch'] ==
'MCA'] it_students = data[data['Branch'] ==
'IT'] co_students = data[data['Branch'] ==
'CO'] mca_count = len(mca_students)
it_count = len(it_students) co_count =
len(co_students)


print(f"Total MCA students:
{mca_count}") print(f"Total IT
students: {it_count}") print(f"Total CO
students: {co_count}")
```



```
Total MCA students: 8
Total IT students: 4
Total CO students: 0
```

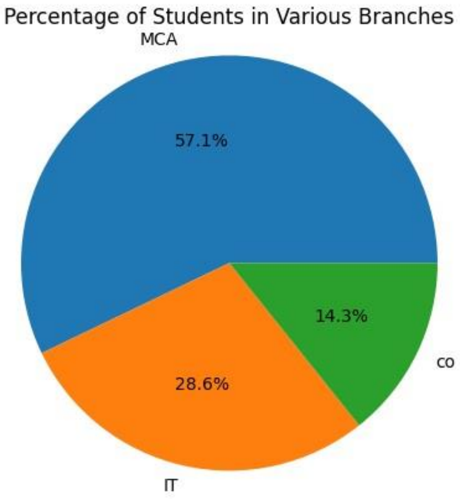
D - A program to display pie charts showing the percentage of students in various branches.

import pandas
as pd import
matplotlib.pyplo
t as plt

data = pd.read_csv('student.csv')

branch_counts = data['Branch'].value_counts()
branches = branch_counts.index.tolist()
student_counts = branch_counts.values.tolist()
total_students = sum(student_counts)

percentages = [(count / total_students) * 100 for count in student_counts] plt.pie(percentages, labels=branches, autopct='%1.1f%%') plt.title('Percentage of Students in Various Branches') plt.axis('equal') plt.show()

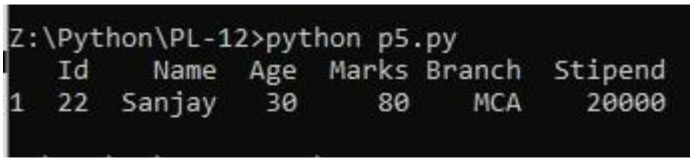


E - Display name of student with maximum stipend.

import pandas as pd

data = pd.read_csv('student.csv')

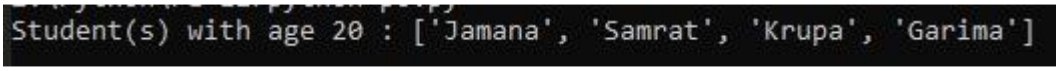
max_stipend =
data['Stipend'].max() name =
data[data['Stipend'] ==
max_stipend] print(name)



```
Z:\Python\PL-12>python p5.py
   Id    Name  Age  Marks Branch  Stipend
1  22  Sanjay   30     80    MCA    20000
```

E. Display names of student who’s age is 20.

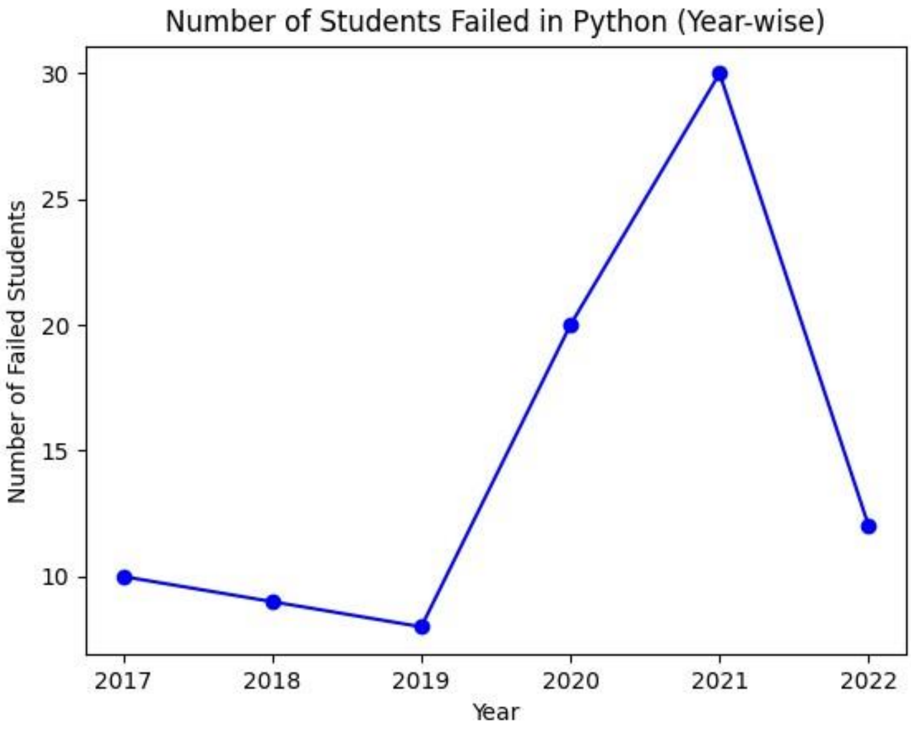
```
import pandas as pd


data = pd.read_csv('student.csv')


filtered_data = data[data['Age'] == 20]

if not filtered_data.empty:     student_names =
filtered_data['Name'].values.tolist()
print(f"Student(s) with age 20 :
{student_names}") else:

    print(f"No student found with age 20")
```



```
Student(s) with age 20 : ['Jamana', 'Samrat', 'Krupa', 'Garima']
```

2. Write a program to create line graph to show the number of students failed in python yearwise. Consider years =[‘2017’, ‘2018’, ‘2019’, ‘2020’, ‘2021’, ‘2022’] and number of students failed as Failed_Students = [10, 9, 8, 20, 30, 12].

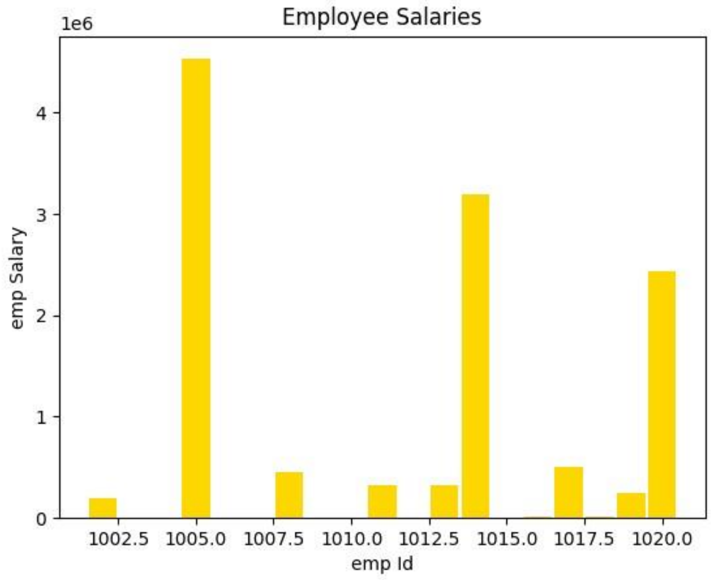
```
import matplotlib.pyplot as plt

years = ['2017', '2018', '2019', '2020', '2021', '2022']
failed_students = [10, 9, 8, 20, 30, 12]

plt.plot(years, failed_students, marker='o', linestyle='-', color='b')
plt.title('Number of Students Failed in Python (Year-wise)')
plt.xlabel('Year')
plt.ylabel('Number of Failed Students')
plt.show()
```



Program – 2

1.To display employee id numbers on X-axis and their salaries on Y-axis in the form of a bar graph

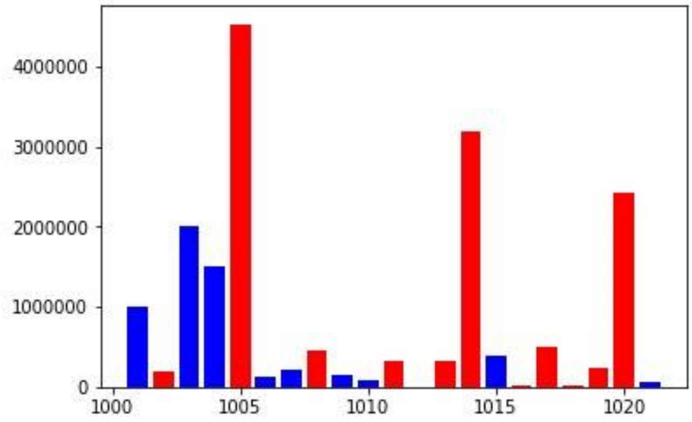
```
import matplotlib.pyplot
as plt import pandas as
pd
Emp = pd.read_csv("EmployeeProduction.csv")
Emp
x = Emp['Id'] y
= Emp['Salary']
plt.xlabel('emp
Id')
plt.ylabel('emp
Salary')
plt.title('Emplo
yee Salaries')

plt.bar(x, y, label='Employee
data',width=0.9,color='gold') plt.show()
```



2. To display employee id numbers on X-axis and their salaries on Y-axis in the form of a bar graph for two departments of a company.

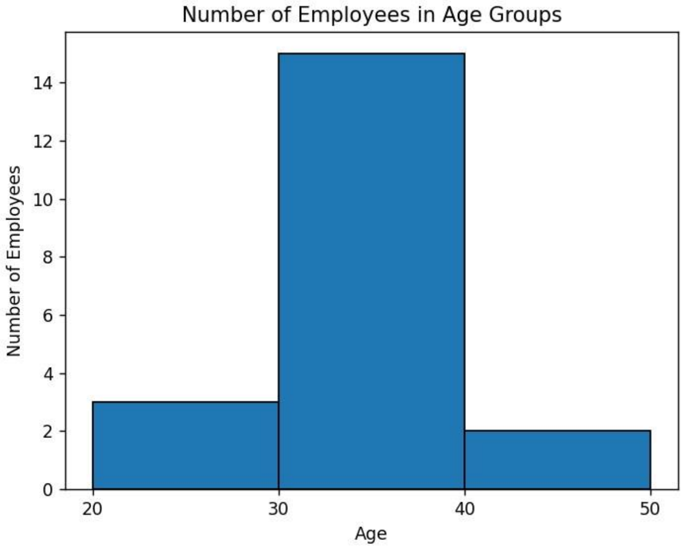
```
import matplotlib.pyplot
as plt import pandas as
pd


Emp = pd.read_csv("EmployeeProduction.csv")

Emp
```

```
x = Emp['Id'] y = Emp['Salary'] x1 = Emp['Id'] y1 =
Emp['Salary'] plt.xlabel('emp Id') plt.ylabel('emp
Salary') plt.title('Employee Salaries') plt.bar(x, y,
label='Sales Department', color='blue') plt.bar(x1,
y1, label='Production Department', color='red')
plt.show()
```



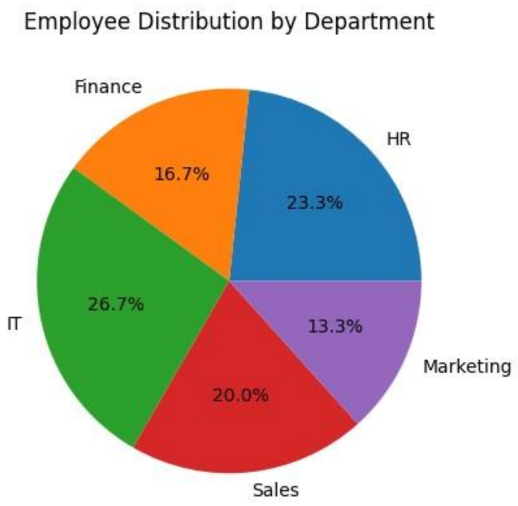
3.To display a histogram showing the number of employees in a specific age group.

```
import matplotlib.pyplot as plt

ages = [28, 35, 42, 39, 33, 30, 32, 28, 37, 40, 35, 32, 31, 29, 30, 35, 38, 31, 35, 36] age_groups =
[20, 30, 40, 50]


plt.hist(ages, bins=age_groups, edgecolor='black')
plt.xlabel('Age')

plt.ylabel('Number of Employees')
plt.title('Number of Employees in
Age Groups') plt.xticks(age_groups)
plt.show()
```



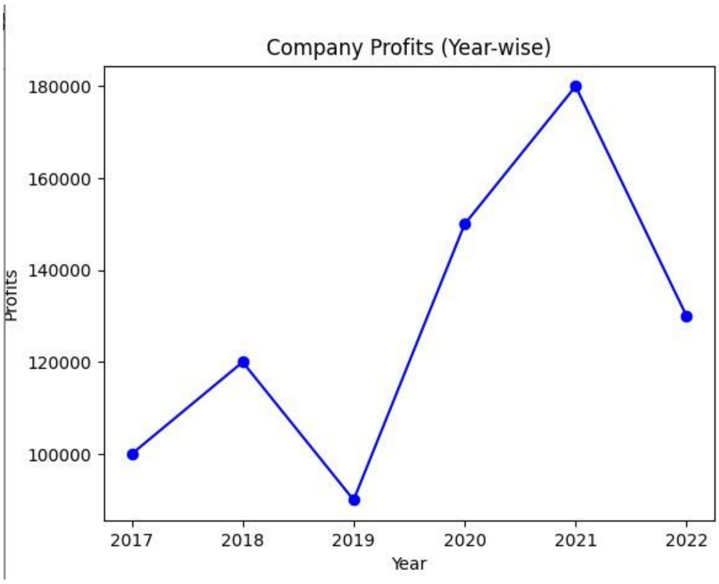
4. To display a pie chart showing the percentage of employees in each department of a company

```
import matplotlib.pyplot as plt


departments = ['HR', 'Finance', 'IT', 'Sales',
'Marketing'] employee_counts = [35, 25, 40, 30, 20]


plt.pie(employee_counts, labels=departments,
autopct='%1.1f%%') plt.title('Employee Distribution by
Department') plt.show()
```



5. To create a line graph to show the profits of a company in various years.

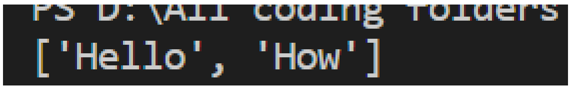
```
import matplotlib.pyplot as plt

years = ['2017', '2018', '2019', '2020', '2021', '2022']
profits = [100000, 120000, 90000, 150000, 180000,
130000]

plt.plot(years, profits, marker='o', linestyle='-',
color='b') plt.title('Company Profits (Year-wise)')
plt.xlabel('Year'
)
plt.ylabel('Profi
ts')
 plt.show()
```



Assignment 13:-

1.A python program to create a regular expression to retrieve all words starting with a in a given string.

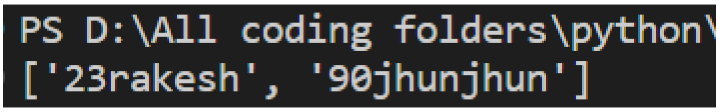
```
import re
str = "Hello, How are you,jyoti"
result = re.findall(r'H[\w]*',str)
print(result)
```



```
PS D:\All coding folders
['Hello', 'How']
```

2.A python program to create a regular expression to retrieve all words starting with a numeric digit.

```
import re
str="Hello, my name is 23rakesh,90jhunjhun"
result = re.findall(r'\d[\w]*',str)
print(result)
```

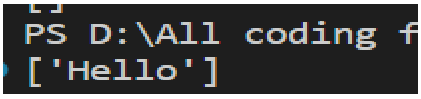


```
PS D:\All coding folders\python\
['23rakesh', '90jhunjhun']
```

3.A python program to create a regular expression to retrieve all words having 5 characters length.

```
import re
str = "Hello, How are you,prbhat"
result = re.findall(r'\b\w{5}\b',str)
```

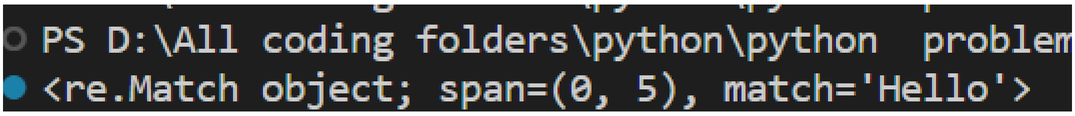
print(result)



```
PS D:\All coding f
['Hello']
```

4.A python program to create a regular expression to retrieve all words having 5 characters length using search().

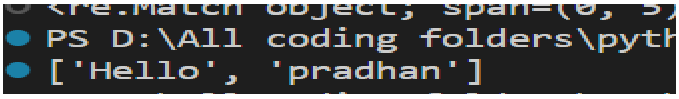
```
import re
str = "Hello, How are
you,krishna"
result =
re.search(r'\b\w{5}\b',st
r)
print(result))
```



```
PS D:\All coding folders\python\python  problem
<re.Match object; span=(0, 5), match='Hello'>
```

5.A python program to create a regular expression to retrieve all words having length of at least 4 characters.

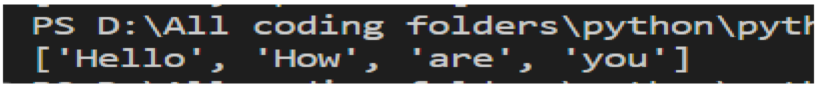
```
import re
str = "Hello, How are you,pradhan"
result = re.findall(r'\b\w{4,}\b',str)
print(result)
```



```
<re.Match object; span=(0, 5)
PS D:\All coding folders\pyth
['Hello', 'pradhan']
```

6.A python program to create a regular expression to retrieve all words having length of 3 or 4 or 5 characters.

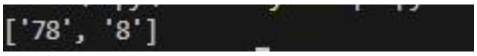
```
import re
str = "Hello, How are you,harish"
result = re.findall(r'\b\w{3,5}\b',str)
print(result)
```



```
PS D:\All coding folders\python\pyth
['Hello', 'How', 'are', 'you']
```

7.A python program to create a regular expression to retrieve only single digits from a string.

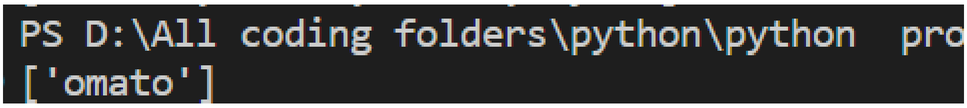
```
import re
str = "Hello, 78 How 8are you, Ranoliya"

result = re.findall(r'\d+',str)
print(result)
```



```
['78', '8']
```

8.A python program to create a regular expression to retrieve the last word of a string, if it starts with t.

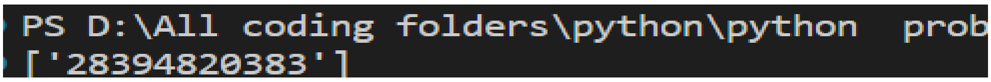
```
import re
str = "tiktak twist topper tomato"
result = re.findall(r't(\w+)$',str)
print(result)
```



```
PS D:\All coding folders\python\python  pro
['omato']
```

9.A python program to create a regular expression to retrieve the phone number of a person from string.

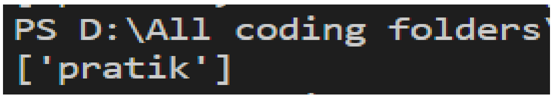
```
import re
str = "pratik - 28394820383"
result = re.findall(r'\d+',str)
print(result)
```



```
PS D:\All coding folders\python\python  prob
['28394820383']
```

10.A python program to create a regular expression to retrieve only name but not the phone number of a person from string.

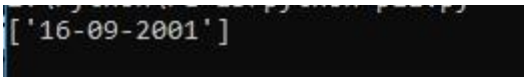
```
import re
str = "pratik - 28394820383"
result = re.findall(r'^\w+',str)
print(result)
```



```
PS D:\All coding folders
['pratik']
```

11.A python program to create a regular expression to retrieve birth date from a string.

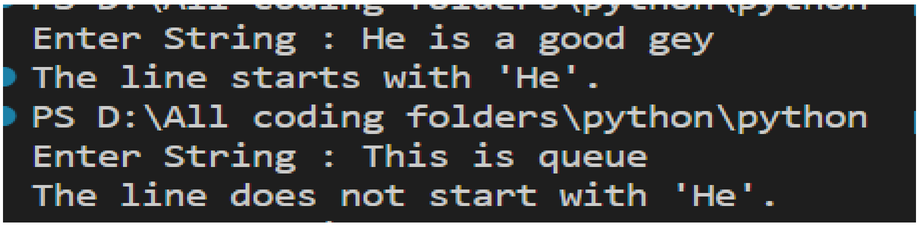
```
import re

str = "My name is Deep. I was born on 16-09-2001 in surat
city." result = re.findall(r'\d{2}[/-]\d{2}[/-]\d{4}',str)
print(result)
```



```
['16-09-2001']
```

12.A python program to create a regular expression to search whether a given string is starting with 'He' or not.

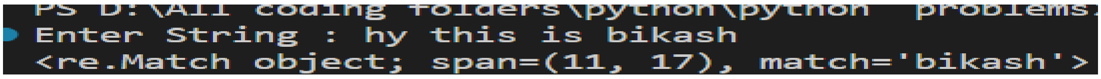
```
import re
str = input("Enter String : ") #search using regex
x = re.search(r'^He', str)

if(x!=None):
        print('The line starts with \'He\'.')
else:
        print('The line does not start with \'He\'.')
```



```
PS D:\All coding folders\python\python
Enter String : He is a good gey
The line starts with 'He'.
PS D:\All coding folders\python\python
Enter String : This is queue
The line does not start with 'He'.
```

13. A python program to create a regular expression to search for a word at the ending of a string.

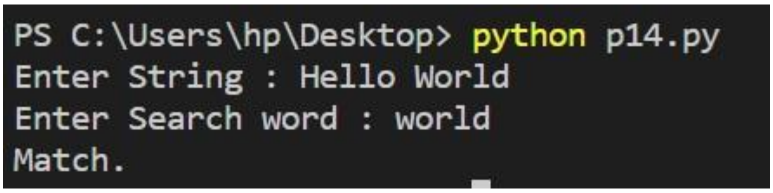
```
import re
str = input("Enter String : ")
x = re.search(r'\w+\S*$', str)
print(x)
```



```
PS D:\All coding folders\python\python  problems
Enter String : hy this is bikash
<re.Match object; span=(11, 17), match='bikash'>
```

14 .A python program to create a regular expression to search for a word at the ending of a string by ignoring the case.

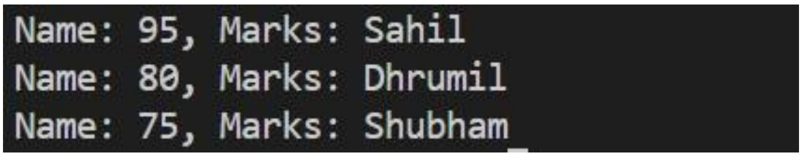
```
import re
str = input("Enter String : ")
word = input("Enter Search word :")

pattern = re.compile(fr'\b{word}\b$', re.IGNORECASE)
x = pattern.search(str)
if(x!=None):
        print('Match.')
else:
        print('Not Match.')
```



```
PS C:\Users\hp\Desktop> python p14.py
Enter String : Hello World
Enter Search word : world
Match.
```

15. A python program to create a regular expression to retrieve marks and names from a given string.

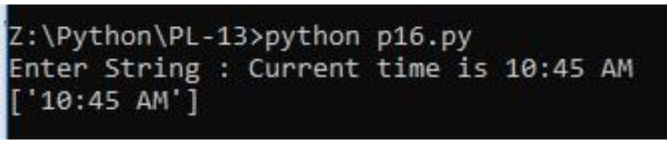
```
import re

def getNameAndMarks(str):
    matches = re.findall(r'(\w+)\s*-\s*(\d+)', str)
    result = []

    for match in matches:
     name = match[0]
     marks = int(match[1])
     result.append((name,marks))
     return result
str = "Sahil - 95, Dhrumil - 80, Shubham - 75"
result = getNameAndMarks(str)
for marks, name in result:
    print("Name: {0}, Marks: {1}".format(name,marks))
```



```
Name: 95, Marks: Sahil
Name: 80, Marks: Dhrumil
Name: 75, Marks: Shubham
```

16. A python program to create a regular expression to retrieve the timing s either ‘am’ or ‘pm’.

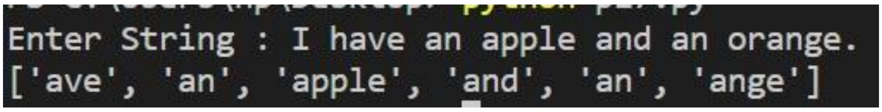
```
                        import re
          str = input("Enter String : ")
x=re.findall(r'\d{2}[:]\d{2}\s?(?:am|pm
                   |AM|PM)$',str)
                          print(x)
```



```
Z:\Python\PL-13>python p16.py
Enter String : Current time is 10:45 AM
['10:45 AM']
```

17. A python program to create a regular expression to find all words starting with ’an’ or ’ak’ .

```
import re
str = input("Enter String : ")
result = re.findall(r'[an|ak]\w+',str)
print(result)
```



```
Enter String : I have an apple and an orange.
['ave', 'an', 'apple', 'and', 'an', 'ange']
```

Assignment – 14 :

1. With data given in CancerData.csv create a classification model to predict breast tumour data into malignant breast tumour or benign breast tumour and obtain its accuracy level.

```
import pandas as pd

from sklearn.model_selection import
train_test_split from sklearn.ensemble import
RandomForestClassifier from sklearn.metrics
import accuracy_score


data = pd.read_csv('CancerData.csv')


X = data.drop('id', axis=1)  #
Features y = data['id']  #
Target variable


X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42) classifier = RandomForestClassifier(random_state=42)
classifier.fit(X_train, y_train) y_pred = classifier.predict(X_test)


accuracy = accuracy_score(y_test, y_pred)

print("Accuracy:", accuracy)
```

2. With data given in iris.csv create a classification model to classify iris data into setosa, virginica, versicolor using iris dataset and obtain its accuracy level.

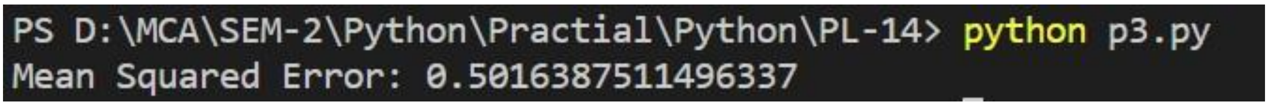
```
import pandas as pd

from sklearn.model_selection import
train_test_split from sklearn.linear_model
import LogisticRegression from sklearn.metrics
import accuracy_score


data = pd.read_csv('iris.csv')
```

```
X =
data.drop('species',
axis=1) y =
data['species']


X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42) model = LogisticRegression() model.fit(X_train, y_train) y_pred =
model.predict(X_test)

accuracy = accuracy_score(y_test, y_pred)


print("Accuracy:", accuracy)
```

Output :

3. Implement a python program that takes internal marks (x), finds the equation that best fits the data and is able to predict External marks using the data given in q9.csv. (Use linear regression)

```
import pandas as pd from
sklearn.model_selection import
train_test_split from sklearn.linear_model
import LinearRegression from
sklearn.metrics import
mean_squared_error


data = pd.read_csv('q9.csv')


X = data['InteralMarks'].values.reshape(-1, 1)  #
Features y = data['ExternalMarks'].values  # Target
variable


X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42) regression = LinearRegression() regression.fit(X_train, y_train)
y_pred = regression.predict(X_test) mse = mean_squared_error(y_test, y_pred)


print("Mean Squared Error:", mse)
```

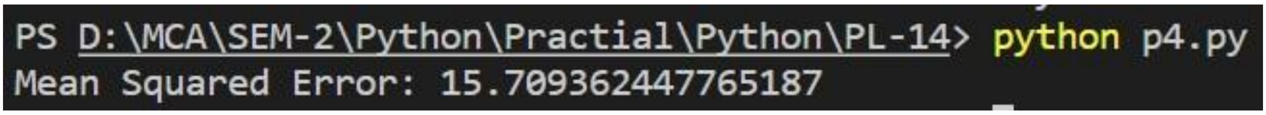


```
PS D:\MCA\SEM-2\Python\Practial\Python\PL-14> python p3.py
Mean Squared Error: 0.5016387511496337
```

4. Implement a python program that takes Population (x), finds the equation that best fits the data and is able to predict Profit using the data given in

PopulationProfit.csv. (Use linear regression)

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error

data = pd.read_csv('PopulationProfit.csv')

X = data['Population(in lakhs)'].values.reshape(-1, 1)  # Features y = data['Profit (in
Lakhs)'].values  # Target variable

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)
regression = LinearRegression()

regression.fit(X_train, y_train)
y_pred = regression.predict(X_test)
mse = mean_squared_error(y_test, y_pred)

print("Mean Squared Error:", mse)
```

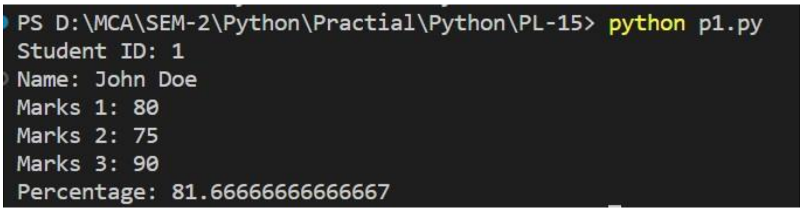


```
PS D:\MCA\SEM-2\Python\Practial\Python\PL-14> python p4.py
Mean Squared Error: 15.709362447765187
```

Assignment – 15

1. Consider a student object; write a student class with attributes id, name,marks1, marks2 and marks3 and methods display and calculate_Percentage. Define constructor. Use pickle to dump and load the object student in and from a binary file.

```
import pickle


class Student:    def __init__(self, student_id, name,
marks1, marks2, marks3):
    self.id =
student_id
self.name = name
self.marks1 = marks1
self.marks2 = marks2
self.marks3 = marks3


def display(self):
        print("Student ID:", self.id)
        print("Name:", self.name)
        print("Marks 1:", self.marks1)
        print("Marks 2:", self.marks2)
        print("Marks 3:", self.marks3)
  def calculate_percentage(self):      total_marks =
self.marks1 + self.marks2 + self.marks3
percentage = (total_marks / 300) * 100      return
percentage


student = Student(1, "John Doe", 80, 75, 90)


with open("student.bin", "wb") as file:

  pickle.dump(student, file)


with open("student.bin", "rb") as file:

  student = pickle.load(file)


student.display()

percentage = student.calculate_percentage()
print("Percentage:", percentage)
```

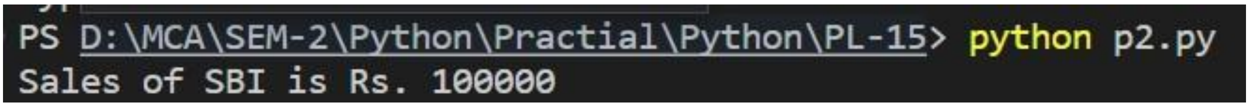


```
PS D:\MCA\SEM-2\Python\Practial\Python\PL-15> python p1.py
Student ID: 1
Name: John Doe
Marks 1: 80
Marks 2: 75
Marks 3: 90
Percentage: 81.66666666666667
```

2. Consider bank object with attributes BankName, BranchCode, BranchName, and Sales. Define Constructor and methods display (Displaying total Sales of a bank with bank name) and TotalSalesofBank to find total sales of the bank. Use pickle to dump and load the object student in and from a binary file.

Output should be “Sales of SBI is Rs. 100000”

```
import pickle

class Bank:
def __init__(self, bank_name, branch_code, branch_name, sales):
self.bank_name = bank_name
self.branch_code = branch_code
self.branch_name = branch_name
self.sales = sales

def display(self):
print("Sales of", self.bank_name, "is Rs.", self.sales)

def TotalSalesofBank(self,bank):
total_sales = sum(bank.sales)
return total_sales

bank = Bank("SBI", "1234", "Main Branch", 100000)

with open("bank.bin", "wb") as file:
pickle.dump(bank, file)

with open("bank.bin", "rb") as file:
bank = pickle.load(file)

bank.display()
```



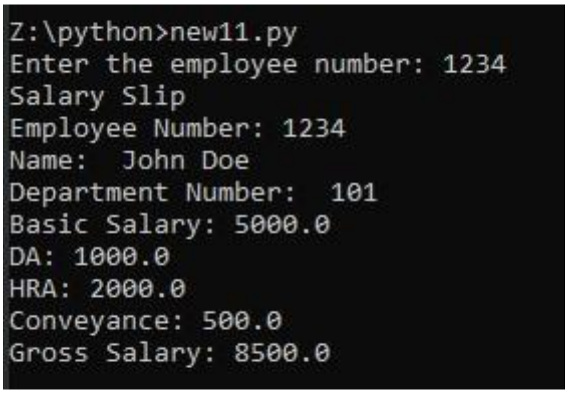
```
PS D:\MCA\SEM-2\Python\Practial\Python\PL-15> python p2.py
Sales of SBI is Rs. 100000
```

18. Write a program in python to implement Salary printing file read operation. (File format: EmployeeNo, name, deptno, basic, DA, HRA, and Conveyance) should perform below operations.

a) Print Salary Slip for given Employee Number

```
def print_salary_slip(employee_number):

    with open('salary_file.txt', 'r') as file:

        found = False

        for line in file:

            values = line.strip().split(',')

            if values[0] == employee_number:

                found = True

        name = values[1]
```

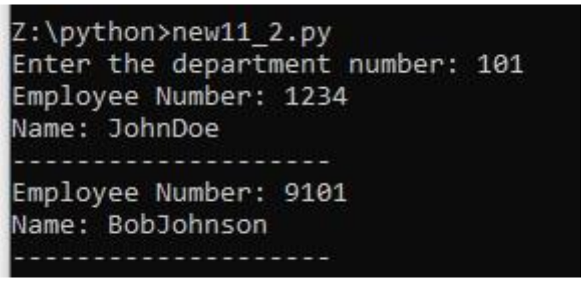
```
            deptno = values[2]

            basic = float(values[3])

            da = float(values[4])

            hra = float(values[5])

            conveyance = float(values[6])

            gross_salary = basic + da + hra + conveyance

            print("Salary Slip")

            print("Employee Number:", employee_number)

            print("Name:", name)

            print("Department Number:", deptno)

            print("Basic Salary:", basic)

            print("DA:", da)

            print("HRA:", hra)

            print("Conveyance:", conveyance)

            print("Gross Salary:", gross_salary)

            break


if not found:

    print("Employee number not found in the file.")


employee_no = input("Enter the employee number: ")

print_salary_slip(employee_no)
```



```
Z:\python>new11.py
Enter the employee number: 1234
Salary Slip
Employee Number: 1234
Name:  John Doe
Department Number:  101
Basic Salary: 5000.0
DA: 1000.0
HRA: 2000.0
Conveyance: 500.0
Gross Salary: 8500.0
```

b) Print Employee List for Given Department Number

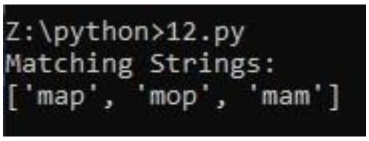
```
def print_employee_list(department_number):
    with open('salary_file.txt', 'r') as file:
            found = False
            for line in file:
                values = line.strip().split(',')
                if values[2] == department_number:
                    found = True
        employee_number = values[0]
        name = values[1]
        print("Employee Number:", employee_number)
        print("Name:", name)
    print("--------------------")
    if not found:
       print("No employees found for the given department number.")
department_no = input("Enter the department number: ")
print_employee_list(department_no)
```



```
Z:\python>new11_2.py
Enter the department number: 101
Employee Number: 1234
Name: JohnDoe
--------------------
Employee Number: 9101
Name: BobJohnson
--------------------
```

19. Write a program to create a regular expression to search for strings starting with m and having a total of 3 characters.

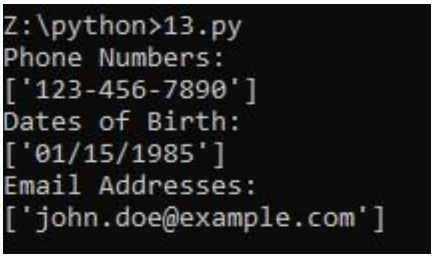
```
import re
def search_strings(strings):
       pattern = r'^m\w{2}$'
       matching_strings = []
       for string in strings:
              if re.match(pattern, string):
                     matching_strings.append(string)
                     return matching_strings
input_strings = ['map', 'mouse', 'car', 'mop', 'dog', 'moon', 'mam', 'mars']
result = search_strings(input_strings)
print("Matching Strings:")
print(result)
```



```
Z:\python>12.py
Matching Strings:
['map', 'mop', 'mam']
```

20. Write a program to create a regular expression to retrieve phone number, date of birth and email address of a person.

```
import re
def extract_information(text):
    phone_pattern = r'\b\d{3}-\d{3}-\d{4}\b'
    dob_pattern = r'\b\d{2}/\d{2}/\d{4}\b'
        email_pattern = r'\b[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[A-Za-z]{2,}\b'

                phone_numbers = re.findall(phone_pattern, text)
        dobs = re.findall(dob_pattern, text)
        emails = re.findall(email_pattern, text)
                return phone_numbers, dobs, emails
input_text = "John Doe's phone number is 123-456-7890. His date of birth is 01/15/1985. You can
reach him at john.doe@example.com."
phone_numbers, dobs, emails = extract_information(input_text)
print("Phone Numbers:")
print(phone_numbers)
print("Dates of Birth:")
print(dobs)
print("Email Addresses:")
print(emails)
```



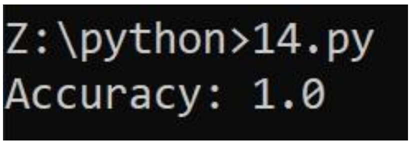
```
Z:\python>13.py
Phone Numbers:
['123-456-7890']
Dates of Birth:
['01/15/1985']
Email Addresses:
['john.doe@example.com']
```

21. Implement a program to demonstrate classification problems.

```
from sklearn.datasets import load_iris
from sklearn.model_selection import
train_test_split from sklearn.tree import
DecisionTreeClassifier

from sklearn.metrics import accuracy_score


iris = load_iris()


X = iris.data

y = iris.target
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)


classifier = DecisionTreeClassifier()


classifier.fit(X_train, y_train)


y_pred = classifier.predict(X_test)


accuracy = accuracy_score(y_test, y_pred)

print("Accuracy:", accuracy)
```

Output :



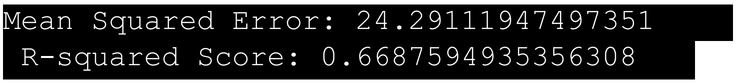
```
Z:\python>14.py
Accuracy: 1.0
```

22. Implement a program to demonstrate regression problem.

```
from sklearn.datasets import load_boston from
sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error,
r2_score


boston = load_boston()


X = boston.data

y = boston.target


X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)


model = LinearRegression()


model.fit(X_train, y_train)


y_pred = model.predict(X_test)


mse = mean_squared_error(y_test, y_pred)
```

```
r2 = r2_score(y_test, y_pred)


print("Mean Squared Error:", mse)

print("R-squared Score:", r2)
```

Output :



```
Mean Squared Error: 24.29111947497351
 R-squared Score: 0.6687594935356308
```

END