

## Python Practical (208) – Assignment-2

'''

**Q.1. Write a Python program to take input of non-zero numbers, with an appropriate prompt, from the user until the user enters a zero. Find total number of numbers entered and their sum.**

**Display count and sum with appropriate titles.**

'''

```
count = 0
```

```
sum = 0
```

```
while(True):
```

```
    print("Enter 0 to stop.")
```

```
    num = input("Enter Non-Zero Number : ")
```

```
    if num.isnumeric():
```

```
        num = int(num)
```

```
        if (num == 0):
```

```
            break
```

```
        count += 1
```

```
        sum += num
```

```
    else:
```

```
        print("please enter numbers only....")
```

```
print("Count : ",count)
```

```
print("Sum : ",sum)
```

'''

**Q.2. Write a Python program to take input of positive numbers, with an appropriate prompt, from the user until the user enters a zero. Find total number of odd & even numbers entered and sum of odd and even numbers. Display total count of odd & even numbers and sum of odd & even numbers with appropriate titles.**

'''

```
countOdd = 0
sumOdd = 0
countEven = 0
sumEven = 0
while(True):
    print("Enter 0 to stop.")
    num = input("Enter Positive Number : ")
    if num.isnumeric():
        num = int(num)
        if (num == 0):
            break
        if (num%2 == 0):
            countEven += 1
            sumEven += num
        else:
            countOdd += 1
            sumOdd += num
    else:
        print("please enter positive numbers only....")
        print("Count Of Even Numbers : ",countEven)
        print("Sum Of Even Numbers: ",sumEven)
        print("Count Of Odd Numbers : ",countOdd)
        print("Sum Of Odd Numbers: ",sumOdd)
```

'''

**Q.3. Write a Python program to take input of a positive number, with an appropriate prompt, from the user. The user should be prompted again to enter the number until the user enters a positive number. Check whether the number is a prime number or not and accordingly display appropriate message.**

'''

```
num = 0
while(True):
    num = input("Enter Positive Number : ")
    if num.isnumeric():
        num = int(num)
        if num == 0:
            print("please enter > 0 numbers only....")
            continue
        break
    else:
        print("please enter positive numbers only....")
flag = 0
for i in range(2,num):
    if(num%i == 0):
        flag = 1
        break
if (flag == 0):
    print(num , " is Prime Number")
else:
    print(num , " is Not Prime Number")
```

'''

**Q.4. Write a Python program to take input of a positive number, say N, with an appropriate prompt, from the user. The user should be prompted again to enter the number until the user enters a positive number. Find the sum of first N odd numbers and first N even numbers. Display both the sums with appropriate titles.**

'''

```
num = 0
while(True):
    num = input("Enter Positive Number : ")
    if num.isnumeric():
        num = int(num)
        break
    else:
        print("please enter positive numbers only....")
sumEven = 0
sumOdd = 0
i=2
j=1
for k in range(num):
    sumEven = sumEven + i
    i = i + 2
    sumOdd += j
    j +=2
print("Sum Of ", num , "Even Numbers: ",sumEven)
print("Sum Of ", num , "Odd Numbers: ",sumOdd)
```

'''

**Q.5. Consider a list of numbers. Write a Python program to do the following:**

**1) Count total number of numbers in the list**

**2) Sum and Average of all the numbers in the list**

**3) Count and sum of all the odd numbers in the list**

**4) Count and sum of all the even numbers in the list**

**5) Find the largest number in the list**

**6) Find the smallest number in the list**

**Display all the values with appropriate titles.**

'''

```
def count(numList):
```

```
    print("Count : ",len(numList))
```

```
def sumAvg(numList):
```

```
    sum = 0
```

```
    for i in numList:
```

```
        sum += i
```

```
    avg = sum / len(numList)
```

```
    print("Sum : ",sum)
```

```
    print("Average : ",avg)
```

```
def countSumOdd(numList):
```

```
    sum = 0
```

```
    count = 0
```

```
    for i in numList:
```

```
        if (i%2 == 1):
```

```
            sum += i
```

```
            count += 1
```

```
    print("Count Odd Numbers : ",count)
```

```
    print("Sum of Odd Numbers : ",sum)
```

```
def countSumEven(numList):
```

```
sum = 0
count = 0
for i in numList:
    if (i%2 == 0):
        sum += i
        count += 1
print("Count Even Numbers : ",count)
print("Sum of Even Numbers : ",sum)
```

```
def findMax(numList):
    print("Maximum value in List : ",max(numList))
```

```
def findMin(numList):
    print("Minimum value in List : ",min(numList))
```

```
numList = [1,2,3,4,5,6,7,8,9,10]
count(numList)
sumAvg(numList)
countSumOdd(numList)
countSumEven(numList)
findMax(numList)
findMin(numList)
```

'''

**Q.6. Consider a list of characters (characters may be alphabets, special characters, digits). Write a Python program to do the following:**

- 1) Count total number of elements in the list**
- 2) Count total number of vowels in the list (vowels are 'a', 'e', 'i', 'o', 'u')**
- 3) Count total number of consonants in the list (a consonant is an alphabet other than vowel)**
- 4) Count total number of characters other than vowels and consonants**

**Display all the values with appropriate titles.**

'''

```
def count(charList):  
    print("Count : ",len(charList))  
  
def countVowel(charList,vowels):  
    count = 0  
    for i in charList:  
        if(i.isalpha()):  
            if i in vowels:  
                count += 1  
    print("Count of Vowels : ",count)  
  
def countConsonant(charList,vowels):  
    count = 0  
    for i in charList:  
        if(i.isalpha()):  
            if i not in vowels:  
                count += 1  
    print("Count of Consonants : ",count)  
  
def countOther(charList):  
    count = 0  
    for i in charList:  
        if(i.isalpha() == False):
```

```
count += 1
```

```
print("Count of Character other than vowels & Consonants : ",count)
```

```
vowels = ['A','a','E','e','I','i','O','o','U','u']
```

```
charList = ['A','$','*','a','s','1','3','U','k']
```

```
count(charList)
```

```
countVowel(charList,vowels)
```

```
countConsonant(charList,vowels)
```

```
countOther(charList)
```



'''

**Q.7. Consider a single list consisting of integer values, float values, character values, string values and lists. Write a Python program to do the following:**

**1) Count total number of elements in the list**

**2) Count total number of integer values, float values, character values, string values and lists**

**Display all the values with appropriate titles.**

'''

```
def count(charList):
```

```
    print("Count : ",len(charList))
```

```
def countAll(charList):
```

```
    countInt = 0
```

```
    countFloat = 0
```

```
    countChar = 0
```

```
    countStr = 0
```

```
    countList = 0
```

```
    for i in charList:
```

```
        if(isinstance(i,list)):
```

```
            countList +=1
```

```
        elif(isinstance(i,int)):
```

```
            countInt += 1
```

```
        elif(isinstance(i,float)):
```

```
            countFloat += 1
```

```
        elif(isinstance(i,str)):
```

```
            if (len(i) == 1):
```

```
                countChar += 1
```

```
            else:
```

```
                countStr += 1
```

```
    print("Count of List : ",countList)
```

```
    print("Count of Integers : ",countInt)
```

```
    print("Count of Floats : ",countFloat)
```

```
    print("Count of Characters : ",countChar)
```

```
print("Count of Strings : ",countStr)
```

```
charList = ['A','$','*',1,2,4.5,6.7,[1,2,3,4],'Chandani','Singh']
```

```
count(charList)
```

```
countAll(charList)
```

'''

**Q.8. Write a Python program to read a m X n matrix and find the following:**

- 1) Find sum of each row and each column.**
- 2) Find the highest and lowest from each row, each column, and the whole matrix.**
- 3) Find the sum of its diagonal elements if the matrix is a square matrix.**
- 4) Find the transpose of the matrix.**

**Display all the values with appropriate titles.**

'''

```
def takeMatrix(n,m):
```

```
    mat = []
```

```
    for i in range(n):
```

```
        temp=[]
```

```
        for j in range(m):
```

```
            x=int(input('Enter number : '))
```

```
            temp.append(x)
```

```
        mat.append(temp)
```

```
        temp = []
```

```
    return mat
```

```
def showMatrix(mat,n,m):
```

```
    for i in range(n):
```

```
        for j in range(m):
```

```
            print(mat[i][j],end = " ")
```

```
        print("\n")
```

```
def sumRowWise(mat,n,m):
```

```
    for i in range(n):
```

```
        sum =0
```

```
        for j in range(m):
```

```
            sum += mat[i][j]
```

```
        print("Sum of ",i+1,"th Row : ",sum)
```

```
def sumColWise(mat,n,m):  
    for i in range(m):  
        sum =0  
        for j in range(n):  
            sum += mat[j][i]  
        print("Sum of ",i+1,"th Column : ",sum)
```

```
def maxRowWise(mat,n,m):  
    k = 0  
    for i in mat:  
        print("Max of Row-",k+1," : ",max(i))  
        k += 1
```

```
def maxColWise(mat,n,m):  
    for i in range(m):  
        max = mat[0][i]  
        for j in range(n):  
            if(mat[j][i] > max):  
                max = mat[j][i]  
        print("Max of Column-",i+1," : ",max)
```

```
def minRowWise(mat,n,m):  
    k = 0  
    for i in mat:  
        print("Min of Row-",k+1," : ",min(i))  
        k += 1
```

```
def minColWise(mat,n,m):  
    for i in range(m):  
        min = mat[0][i]  
        for j in range(n):  
            if(mat[j][i] < min):  
                min = mat[j][i]  
        print("Min of Column-",i+1," : ",min)
```

```
def maxMat(mat):  
    row = max(mat)  
    print("Max of Whole Matrix : ",max(row))
```

```
def minMat(mat):  
    row = min(mat)  
    print("Max of Whole Matrix : ",min(row))
```

```
def isSquare(mat,n,m):  
    if(n== m):  
        return True  
    else:  
        return False
```

```
def diagonalSum(mat,n,m):  
    sum1 = 0  
    sum2 = 0  
    if(isSquare(mat,n,m)):  
        for i in range(n):  
            for j in range(m):  
                if(i==j):  
                    sum1 += mat[i][j]  
                if(i+j == n-1):  
                    sum2 += mat[i][j]  
        print("Matrix is Square")  
        print("1st Diagonal Sum : ",sum1)  
        print("2nd Diagonal Sum : ",sum2)  
    else:  
        print("Matrix is Not Square")
```

```
def transposeMat(oldMat,n,m):
```

```
    mat = []
```

```
    for i in range(m):
```

```
        temp=[]
```

```
        for j in range(n):
```

```
            temp.append(oldMat[j][i])
```

```
        mat.append(temp)
```

```
    temp = []
```

```
    showMatrix(mat,m,n)
```

```
print("Enter Rows and Columns for 1st Matrix : ")
```

```
n=int(input('Enter no. of Rows : '))
```

```
m=int(input('Enter no. of Columns : '))
```

```
mat=takeMatrix(n,m)
```

```
print(mat)
```

```
showMatrix(mat,n,m)
```

```
sumRowWise(mat,n,m)
```

```
sumColWise(mat,n,m)
```

```
maxRowWise(mat,n,m)
```

```
maxColWise(mat,n,m)
```

```
minRowWise(mat,n,m)
```

```
minColWise(mat,n,m)
```

```
maxMat(mat)
```

```
minMat(mat)
```

```
diagonalSum(mat,n,m)
```

```
transposeMat(mat,n,m)
```

'''

**Q.9. Write a Python program to read 2 matrices and find the following, if it is possible to do so:**

**1) Find sum of both the matrices.**

**2) Find difference of both the matrices.**

**3) Find product of both the matrices.**

**Display all the values with appropriate titles.**

'''

```
def sum(mat1,mat2,row,col):
```

```
    mat3 = []
```

```
    for i in range(row):
```

```
        temp = []
```

```
        for j in range(col):
```

```
            x = mat1[i][j] + mat2[i][j]
```

```
            temp.append(x)
```

```
        mat3.append(temp)
```

```
        temp = []
```

```
    return mat3
```

```
def diff(mat1,mat2,row,col):
```

```
    mat3 = []
```

```
    for i in range(row):
```

```
        temp = []
```

```
        for j in range(col):
```

```
            x = mat1[i][j] - mat2[i][j]
```

```
            temp.append(x)
```

```
        mat3.append(temp)
```

```
        temp = []
```

```
    return mat3
```

```
def pro(mat1,mat2,n1,m1,n2,m2):
```

```
    mat3 = []
```

```
    for i in range(n1):
```

```
        temp = []
```

```

for j in range(m2):
    x = 0
    for k in range(m1):
        x += mat1[i][k] * mat2[k][j]
    temp.append(x)
mat3.append(temp)
temp = []
return mat3

```

```

def takeMatrix(n,m):
    mat = []
    for i in range(n):
        temp=[]
        for j in range(m):
            x=int(input('Enter number : '))
            temp.append(x)
        mat.append(temp)
        temp = []
    return mat

```

```

print("Enter Rows and Columns for 1st Matrix : ")
n1=int(input('Enter no. of Rows : '))
m1=int(input('Enter no. of Columns : '))
mat1=takeMatrix(n1,m1)
print(mat1)
print("Enter Rows and Columns for 2nd Matrix : ")
n2=int(input('Enter no. of Rows : '))
m2=int(input('Enter no. of Columns : '))
mat2=takeMatrix(n2,m2)
print(mat2)

```

```

if ((n1 == n2) and (m1 == m2)):
    sumMat = sum(mat1,mat2,n1,m1)
    print("Sum of Matrix : ",sumMat)

```



```
diffMat = diff(mat1,mat2,n1,m1)
print("Difference of Matrix : ",diffMat)
else:
    print("Sum and Difference is Not possible..")

if (m1 == n2):
    proMat = pro(mat1,mat2,n1,m1,n2,m2)
    print("Product of Matrix : ",proMat)
else:
    print("Product is Not possible..")
```