import numpy as np

import matplotlib.pyplot as plt

from prettytable import PrettyTable

z=PrettyTable()

print("calculating linear Regression:")

print("Step1:")

lst=[]

x=int(input("Enter how many elements you want:"))

print('Enter',x,'values of x: ')

for i in range(0,x):

ele=int(input())

lst.append(ele)

print(lst)

lst1=[]

y=int(input('Enter values of y: '))

for j in range(0,y):

ele=int(input())

lst1.append(ele)

print(lst1)

x\_sq=[]

for k in range(0,y):

xq=(lst[k]\*lst[k])

x\_sq.append(xq)

print(x\_sq)

x\_in\_y=[]

for j in range(0,y):

xiny=(lst[j]\*lst1[j])

x\_in\_y.append(xiny)

print(x\_in\_y)

# to sum of x

sumofx=sum(lst)

print(sumofx)

sumofy=sum(lst1)

print(sumofy)

sumofxsq=sum(x\_sq)

print(sumofxsq)

sumofxiny=sum(x\_in\_y)

print(sumofxiny)

print("Equation of straight line: y=ax+b")

a1=(sumofx\*sumofx)

a2=(x\*sumofxsq)

a3=(sumofx)\*(sumofy)

a4=x\*(sumofxiny)

a5=a2-a1

a6=a4-a3

try:

a=a6/a5

except:

print('Sorry cannot divide by zero ')

#a=x\*(sumofxiny)-[(sumofx)\*(sumofy)]/[(x\*sumofxsq)-(sumofx\*sumofx)]

print(a)

b1=a\*sumofx

b2=sumofy-b1

b=b2/x

print(b)

print("Equation of straight line: y=",a,"\*X+",b)

# to show graph

plt.scatter(lst, lst1, color = "m", marker = "o", s = 30)

# predicted response vector

y\_pred=[]

for m in range(0,x):

y\_pre = b + a\*lst[m]

y\_pred.append(y\_pre)

print(y\_pred)

z.field\_names=['X','Y','X\*X','X\*Y','Y predicted']

for n in range(0,y):

z.add\_row([lst[n],lst1[n],x\_sq[n],x\_in\_y[n],y\_pred[n]])

print(z.get\_string())

# plotting the regression line

plt.plot(lst, y\_pred, color = "g")

#plt.plot(lst,lst1,color = "g")

plt.xlabel('x')

plt.ylabel('y')

# function to show plot

plt.show()