#CURVE FITTING SECOND ORDER FOR Voltage across capacitor for charging

import numpy as np

n=int(input('Enter the no.of data points: '))

t=list(map(float,input("Enter the value of time: ").strip().split()))[:n]

vc=list(map(float,input("Enter the capacitor volatge value: ").strip().split()))[:n]

t=np.array(t)

vc=np.array(vc)

sx=sum(t)

sy=sum(vc)

sx2=sum(t\*\*2)

sx3=sum(t\*\*3)

sx4=sum(t\*\*4)

sxy=sum(t\*vc)

sx2y=sum(t\*t\*vc)

p=[[n,sx,sx2],[sx,sx2,sx3],[sx2,sx3,sx4]]

q=[[sy],[sxy],[sx2y]]

cof=np.dot(np.linalg.inv(p),q)

print("Equation of capacitor voltage vc=",cof[0,0],"+",cof[1,0],"t+",cof[2,0],"t^2")