import pandas as pd

df = pd.DataFrame(

{'product\_id': [1, 2, 3, 4, 5, 6, 7, 8, 9, 10],

'price': [52300, 52000, 25000, 61600, 43000, 23400

, 52300, 62000, 62000, 73000],

'quantity': [1, 3, 2, 1, 2, 2, 2, 4, 1, 2],

'city':['Tehran','Rasht','Isfahan','Tabriz','Berlin','Shiraz','London','Paris','Rom','Tehran']

})

# Task1 = Calculate the total sales(quantity\*price) for each product

df['total\_price'] = df['price'] \* df['quantity']

print('total\_price:', df['total\_price'])

# Task2 = Calculate the average sales price for each product

df['avg\_price'] = df['price'] / df['quantity']

print('avg\_price:', df['avg\_price'])

# Task3 = Identify the product with the highest total sales

max\_index = df['price'].idxmax()

print(max\_index)

# Task4 = Calculate the total sales for each region

Total\_sales\_region = df.groupby('city')['total\_price'].sum()

print(Total\_sales\_region)

# Task5 = Identity the region with the highest total sales

max\_Total\_sales\_region= Total\_sales\_region.max()

a= Total\_sales\_region.idxmax()

print('max Total sales region:',a)

import numpy as np

data = np.array([

[1,85,90,80],

[2,75,60,70],

[3,60,65,55],

[4,90,85,88],

[5,55,70,65],

[6,80,75,78],

[7,70,80,75],

[8,65,50,60],

[9,95,92,90],

[10,85,88,82]

])

# Task1 : Calculate avarage scores for each subject

ave\_Math\_score = np.mean(data[:,1])

ave\_Science\_score = np.mean(data[:,2])

ave\_English\_score = np.mean(data[:,3])

print('Avarage Math Score:', ave\_Math\_score)

print('Avarage Science Score:', ave\_Science\_score)

print('Avarage English Score:', ave\_English\_score)

# Task2 : Identify the student with the highest avarage score across all subject

avg\_scores= np.mean(data[:,1:],axis=1)

highest\_avg\_score\_index = np.argmax(avg\_scores)

highest\_avg\_score\_student\_id = int(data[highest\_avg\_score\_index,0])

print('Student with highest avarage score:',highest\_avg\_score\_student\_id)

# Task3 : Determine the correlation between math scores and science scores

math\_scores = data[:,1]

science\_scores = data[:,2]

correlation = np.corrcoef(math\_scores , science\_scores)[0,1]

print('Correlation between math scores and science scores:',correlation)

# Task4 : Identify students who need extra help

average\_all\_subjects=np.mean(data[:,1:],axis=1)

below\_average\_students = data[average\_all\_subjects<np.mean(average\_all\_subjects),0]

print('Students who scored below average in all subjects:',below\_average\_students)

threshold=60

student\_below\_threshold = np.any(data[:,1:]<threshold,axis=1)

print('Student who scored below', threshold,'in any subject:',data[student\_below\_threshold,0])