PHW1

Population(bias=True) - numpy

A black and white squares with white text

Description automatically generated with medium confidence

Sample(bias=False) - numpyA black square with white squares and red squares

Description automatically generated

Sample - pandasA screenshot of a graph

Description automatically generated

Code

*import* numpy *as* np

*import* pandas *as* pd

*import* seaborn *as* sns

df = pd.DataFrame({

'Age':[30,40,50,60,40],

'Income':[200,300,800,600,300],

'Yrs worked':[10,20,20,20,20],

'Vacation':[4,4,1,2,5]

})

df.head()

sns.heatmap(np.cov(df.to\_numpy().T,bias=True),annot=True)

sns.heatmap(np.cov(df.to\_numpy().T,bias=False),annot=True)

sns.heatmap(pd.DataFrame.cov(df),annot=True)

WHW1

X=3500, predict 53579.2301005

X=5300, predict 71172.4923345

m = 9.77403457445

b = 19370.1090899

A piece of paper with writing on it

Description automatically generated

PHW2

A red line and blue dots

Description automatically generated

Code

*import* pandas *as* pd

*import* numpy *as* np

*import* seaborn *as* sns

*from* sklearn *import* linear\_model

*import* matplotlib.pyplot *as* plt

df = pd.DataFrame({

'spends':[2400,2650,2350,4950,3100,2500,5106,3100,2900,1750],

'income':[41200,50100,52000,66000,44500,37700,73500,37500,56700,35600]

})

df.head()

|  | **spends** | **income** |
| --- | --- | --- |
| 0 | 2400 | 41200 |
| 1 | 2650 | 50100 |
| 2 | 2350 | 52000 |
| 3 | 4950 | 66000 |
| 4 | 3100 | 44500 |

model = linear\_model.LinearRegression()

model.fit(df['spends'].to\_numpy()[:,np.newaxis],df['income'].to\_numpy()[:,np.newaxis])

model.coef\_

array([[9.77403457]])

model.intercept\_

array([19370.10908995])

sns.scatterplot(df,x='spends',y='income')

x= np.arange(np.min(df['spends']),np.max(df['spends']),0.1)

plt.plot(x,(x\*model.coef\_ + model.intercept\_)[0],color='r')

plt.show()

A red line and blue dots

Description automatically generated