Unit03 Ex1 covariance_pearson_correlation

July 27, 2023

[23]:
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# calculate the Pearson's correlation between two variables
from numpy import mean
from numpy import std
from numpy import cov
from numpy.random import randn
from numpy.random import seed
from matplotlib import pyplot as plt
import seaborn as sns

from scipy.stats import pearsonr
# seed random number generator
seed(1)

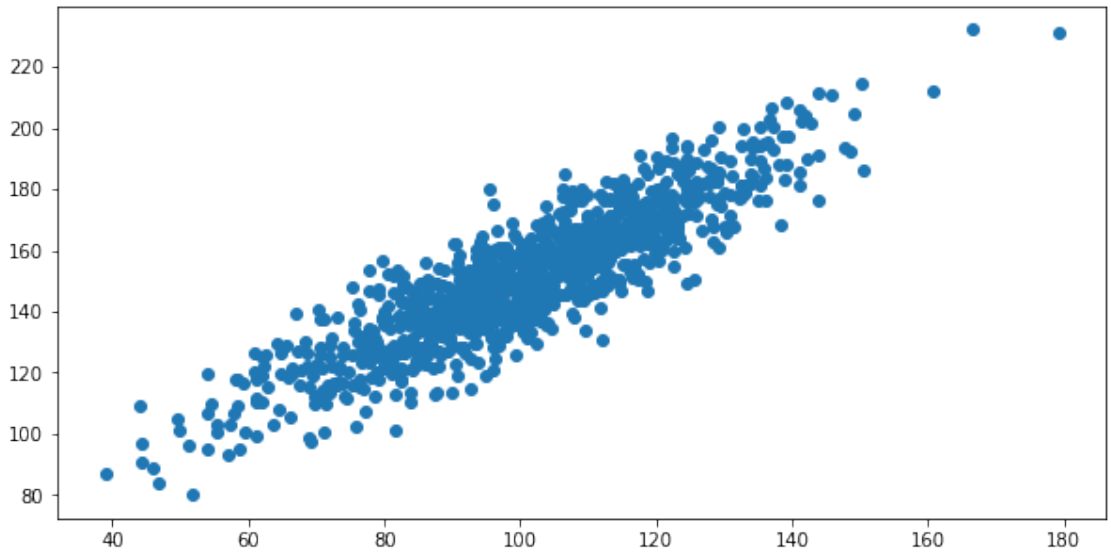
# prepare data
data1 = 20 * randn(1000) + 100
data2 = data1 + (10 * randn(1000) + 50)

# calculate covariance matrix
covariance = cov(data1, data2)

# calculate Pearson's correlation
corr, _ = pearsonr(data1, data2)

# plot
plt.scatter(data1, data2)
plt.show()

# summarize
print('data1: mean=%.3f stdv=%.3f' % (mean(data1), std(data1)))
print('data2: mean=%.3f stdv=%.3f' % (mean(data2), std(data2)))
print('Covariance: %.3f' % covariance[0][1])
print('Pearsons correlation: %.3f' % corr)
```

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data1: mean=100.776 stdv=19.620
data2: mean=151.050 stdv=22.358
Covariance: 389.755
Pearsons correlation: 0.888
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