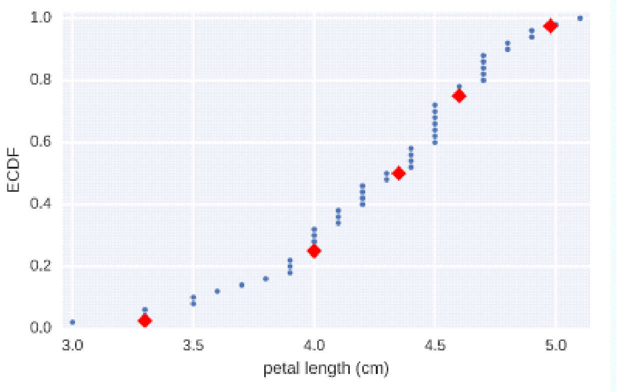
Ch 2 Quantitative exploratory data analysis

November-11-17   3:01 PM

```
#Computing means
# Compute the mean: mean_length_vers
mean_length_vers = np.mean (versicolor_petal_length)

# Print the result with some nice formatting
print('I. versicolor:', mean_length_vers, 'cm')
```



```
#Computing percentiles
# Specify array of percentiles: percentiles
percentiles = np.array ([2.5, 25, 50, 75, 97.5])

# Compute percentiles: ptiles_vers
ptiles_vers = np.percentile (versicolor_petal_length, percentiles)

# Print the result
print (ptiles_vers)
```

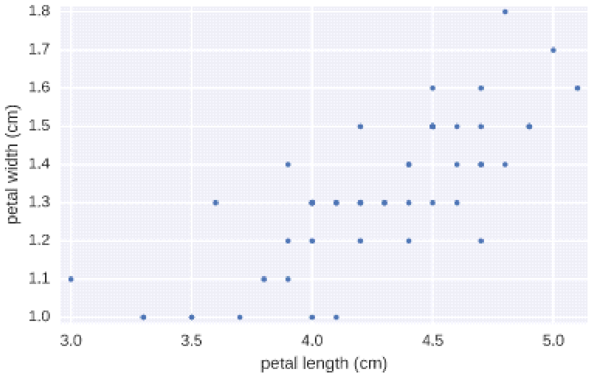
```
#Comparing percentiles to ECDF
# Plot the ECDF
_ = plt.plot(x_vers, y_vers, '.')
plt.margins(0.02)
_ = plt.xlabel('petal length (cm)')
_ = plt.ylabel('ECDF')

# Overlay percentiles as red diamonds.
_ = plt.plot(ptiles_vers, percentiles/100, marker='D', color='red',
        linestyle ='none')

# Show the plot
plt.show ()
```

```
#Box-and-whisker plot
# Create box plot with Seaborn's default settings
sns.boxplot (x = 'species', y = 'petal length (cm)', data = df)

# Label the axes
_ = plt.xlabel ('species')
_ = plt.ylabel ('petal length (cm)')

# Show the plot
plt.show ()
```

```
#Computing the variance
# Array of differences to mean: differences
differences = np.array (versicolor_petal_length - np.mean
(versicolor_petal_length))


# Square the differences: diff_sq
diff_sq = np.array (differences**2)

# Compute the mean square difference: variance_explicit
variance_explicit = np.mean (diff_sq)

# Compute the variance using NumPy: variance_np
variance_np = np.var (versicolor_petal_length)

# Print the results
print (variance_explicit, variance_np)
```

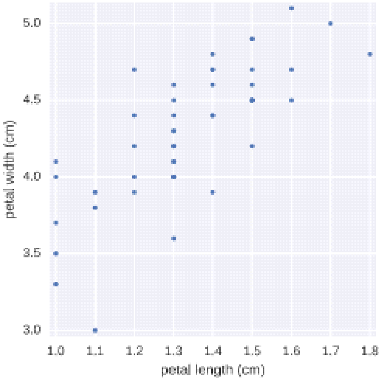
```
#The standard deviation and the variance
# Compute the variance: variance
variance = np.var (versicolor_petal_length)

# Print the square root of the variance
print (np.sqrt (variance))

# Print the standard deviation
print (np.std (versicolor_petal_length))
```

```
#Scatter plots
# Make a scatter plot
_ = plt.plot (versicolor_petal_length, versicolor_petal_width, marker = ".",
linestyle = 'none')


# Set margins
_ = plt.margins (0.02)

# Label the axes
_ = plt.xlabel ('petal length (cm)')
_ = plt.ylabel ('petal width (cm)')

# Show the result
plt.show ()
```



```
#Computing the covariance
# Compute the covariance matrix: covariance_matrix
covariance_matrix = np.cov (versicolor_petal_length,
versicolor_petal_width)

# Print covariance matrix
print (covariance_matrix)

# Extract covariance of length and width of petals: petal_cov
petal_cov = covariance_matrix [0, 1]

# Print the length/width covariance
print (petal_cov)
```

```
#Computing the Pearson correlation coefficient
def pearson_r(x, y):
    """Compute Pearson correlation coefficient between two arrays."""
    # Compute correlation matrix: corr_mat
    corr_mat = np.corrcoef (x, y)

    # Return entry [0,1]
    return corr_mat[0,1]

# Compute Pearson correlation coefficient for I. versicolor: r
r = pearson_r (versicolor_petal_length, versicolor_petal_width)

# Print the result
print (r)
```


petal width (cm)
petal length (cm)