

Figure 12-8. *Boxplot with seaborn*

Multivariate Plots

Common multivariate visualizations include the scatter plot and its extension the pairwise plot, parallel coordinate plots, and the covariance matrix plot.

Scatter Plot

Scatter plot exposes the relationships between two variables in a dataset. The outputs with matplotlib and seaborn are shown in Figure 12-9 and Figure 12-10, respectively.

```
# create the dataset
x = np.random.sample(100)
y = 0.9 * np.asarray(x) + 1 + np.random.uniform(0,0.8, size=(100,))
# scatter plot with matplotlib
```

```
plt.scatter(x,y)
plt.xlabel("x")
plt.ylabel("y")
plt.show()
# scatter plot with seaborn
sns.regplot(x=x, y=y, fit_reg=False)
plt.xlabel("x")
plt.ylabel("y")
plt.show()
```

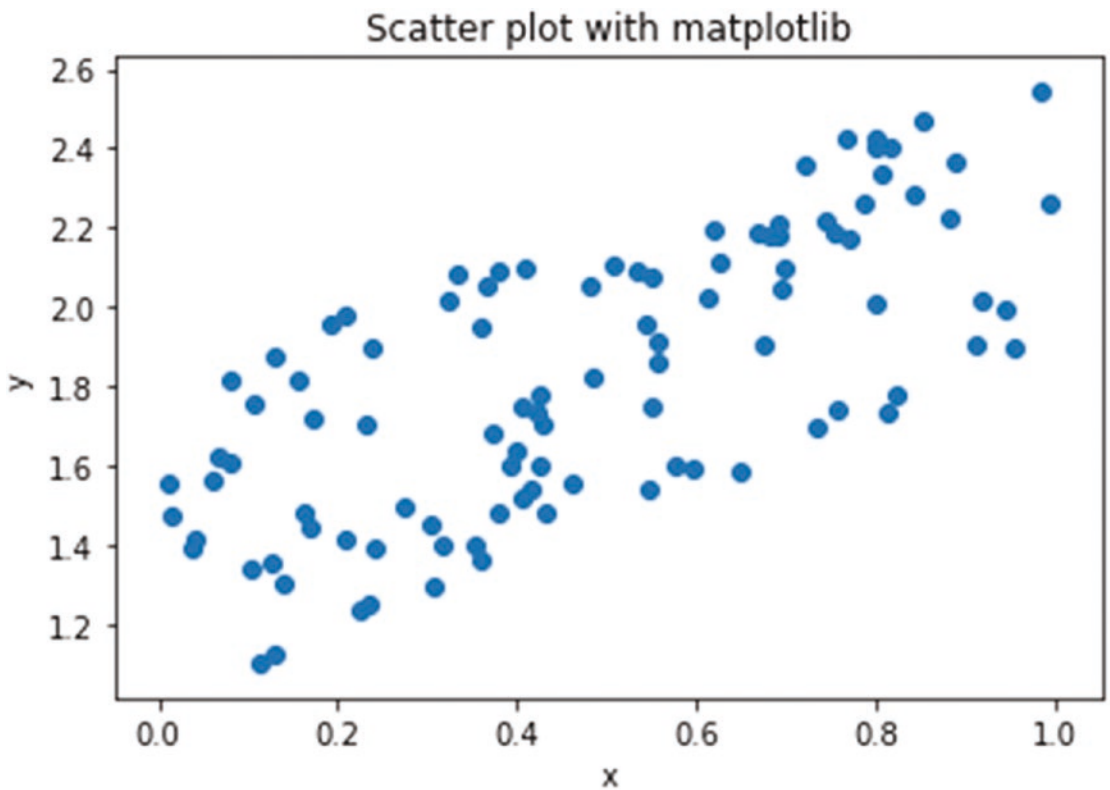


Figure 12-9. Scatter plot with Matplotlib

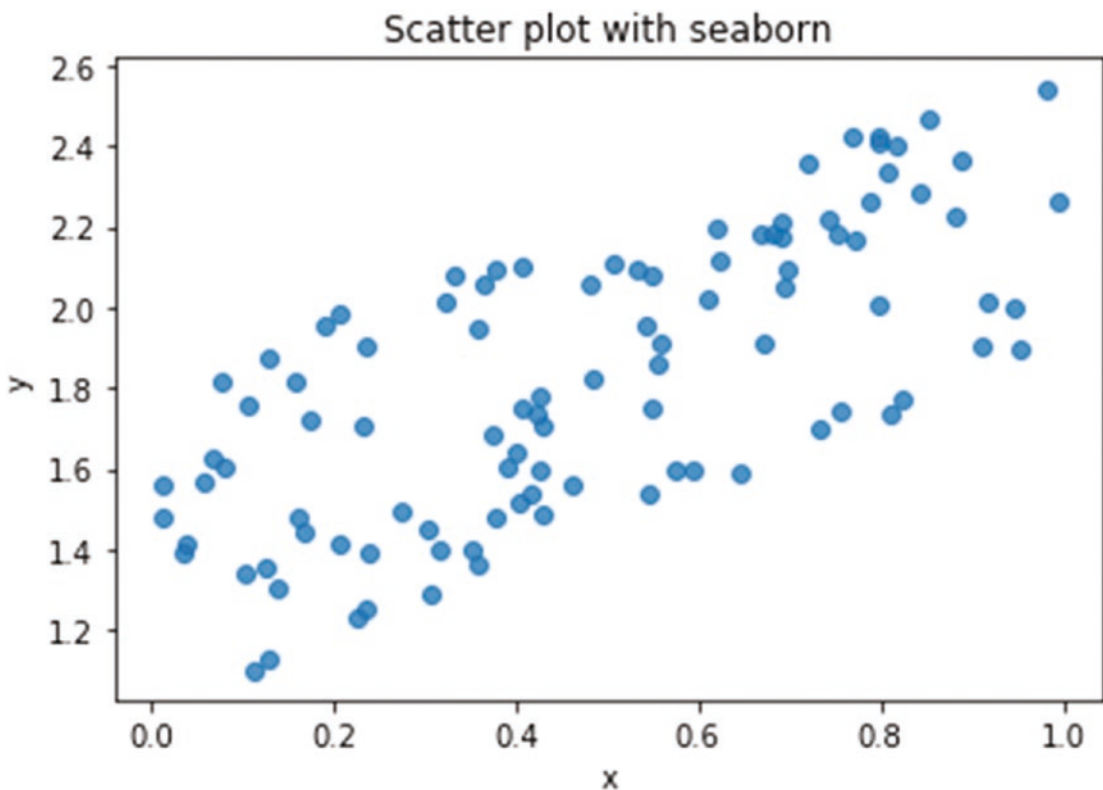


Figure 12-10. *Scatter plot with seaborn*

Pairwise Scatter Plot

Pairwise scatter plot is an effective window for visualizing the relationships among multiple variables within the same plot. However, with higher-dimension datasets, the plot may become clogged up, so use it with care. Let's see an example of this with Matplotlib and seaborn.

Here, we will use the method **scatter_matrix**, one of the plotting functions in Pandas to graph a pairwise scatter plot matrix. The outputs with matplotlib and seaborn are shown in Figure 12-11 and Figure 12-12, respectively.

```
# create the dataset
data = np.random.randn(1000,6)
# using Pandas scatter_matrix
pd.plotting.scatter_matrix(pd.DataFrame(data), alpha=0.5, figsize=(12, 12),
diagonal='kde')
plt.show()
```