Lesson 18 Summary: Seaborn Plots

Data Science with Python – Key Concepts

Data Science Program

Seaborn Overview

Seaborn Statistical Plots

Features:

`set_theme()` | `color_palette()` | `FacetGrid` | `hue`

Seaborn works directly with DataFrames

Seaborn provides statistical visualization on top of matplotlib

Distribution Plots

Visualize univariate distributions:

- **histplot:** Histogram with optional KDE
- **kdeplot:** Smooth density estimate
- **ecdfplot:** Empirical cumulative distribution
- **rugplot:** Individual observations as ticks

Example:

```
sns.histplot(df['Return'], kde=True)
```

Always visualize distributions before statistical analysis

Categorical Plots

Compare groups:

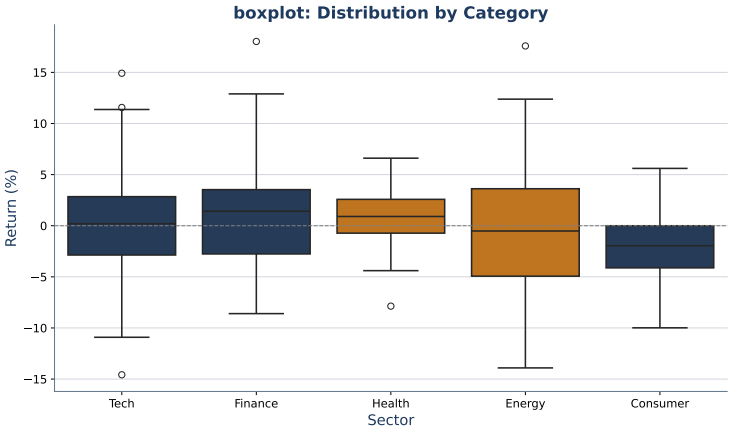
- **boxplot:** Quartiles and outliers
- **violinplot:** Distribution shape by group
- **stripplot:** All data points by category
- **barplot:** Means with confidence intervals

Example:

```
sns.boxplot(data=df, x='Sector', y='Return')
```

Categorical plots reveal group differences

Boxplot by Sector



Compare distributions across categories

Regression Plots

Visualize relationships:

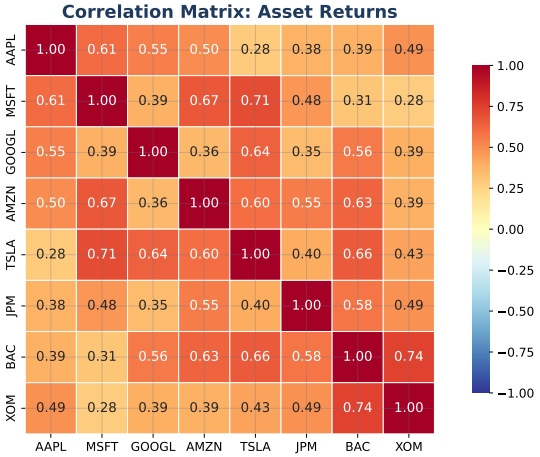
- **regplot:** Scatter with regression line
- **residplot:** Check regression assumptions
- **lmplot:** Faceted regression plots

Example:

```
sns.regplot(data=df, x='Beta', y='Return')
```

Regression plots show linear relationships and fit quality

Heatmaps



Heatmaps visualize matrices like correlation tables

Color Palettes

Consistent, appealing colors:

- **Sequential:** For continuous data
- **Diverging:** For data with midpoint
- **Categorical:** For distinct groups

Usage:

```
sns.set_palette('viridis') # Sequential
sns.color_palette('coolwarm') # Diverging
```

Choose palettes that are colorblind-friendly

Themes and Styles

Built-in aesthetic themes:

- **darkgrid:** Gray background with grid
- **whitegrid:** White background with grid
- **white:** Clean white background
- **ticks:** Minimal with tick marks

Usage:

```
sns.set_theme(style='whitegrid')
```

Consistent themes create professional-looking charts

Quick Reference

Essential Seaborn Commands:

Plot Type	Syntax
Histogram + KDE	`sns.histplot(data, kde=True)`
Boxplot	`sns.boxplot(x='cat', y='val', data=df)`
Violin	`sns.violinplot(...)`
Scatter + reg	`sns.regplot(x='A', y='B', data=df)`
Heatmap	`sns.heatmap(df.corr(), annot=True)`
Theme	`sns.set_theme(style='whitegrid')`
Palette	`sns.set_palette('viridis')`

Seaborn simplifies statistical visualization