

### Seaborn

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### Statistical Data Visualization With Seaborn

The Python visualization library **Seaborn** is based on **matplotlib** and provides a high-level interface for drawing attractive statistical graphics.

Make use of the following aliases to import the libraries:

```
>>> import matplotlib.pyplot as plt
>>> import seaborn as sns
```

The basic steps to creating plots with Seaborn are:

1. Prepare some data
2. Control figure aesthetics
3. Plot with Seaborn
4. Further customize your plot

```
>>> import matplotlib.pyplot as plt
>>> import seaborn as sns
>>> tips = sns.load_dataset("tips")
>>> sns.set_style("whitegrid")
>>> g = sns.lmplot(x="tip", y="total_bill", data=tips, aspect=2)
>>> g = (g.set_axis_labels("Tip", "Total bill (USD)")).set(xlim=(0,10), ylim=(0,100))
>>> plt.title("title")
>>> plt.show(g)
```

## 1 Data

Also see [Lists](#), [NumPy](#) & [Pandas](#)

```
>>> import pandas as pd
>>> import numpy as np
>>> uniform_data = np.random.rand(10, 12)
>>> data = pd.DataFrame({'x':np.arange(1,101), 'y':np.random.normal(0,4,100)})
```

Seaborn also offers built-in data sets:

```
>>> titanic = sns.load_dataset("titanic")
>>> iris = sns.load_dataset("iris")
```

## 2 Figure Aesthetics

Also see [Matplotlib](#)

```
>>> f, ax = plt.subplots(figsize=(5, 6))
```

Create a figure and one subplot

### Seaborn styles

```
>>> sns.set()
>>> sns.set_style("whitegrid")
>>> sns.set_style("ticks", {"xtick.major.size":8, "ytick.major.size":8})
```

(Re)set the seaborn default  
Set the matplotlib parameters  
Set the matplotlib parameters

```
>>> sns.axes_style("whitegrid")
```

Return a dict of params or use with `with` to temporarily set the style

### Axis Grids

```
>>> g = sns.FacetGrid(titanic, col="survived", row="sex")
>>> g = g.map(plt.hist, "age")
>>> sns.factorplot(x="pclass", y="survived", hue="sex", data=titanic)
>>> sns.lmplot(x="sepal_width", y="sepal_length", hue="species", data=iris)
```

Subplot grid for plotting conditional relationships

Draw a categorical plot onto a Facetgrid

Plot data and regression model fits across a FacetGrid

```
>>> h = sns.PairGrid(iris)
>>> h = h.map(plt.scatter)
>>> sns.pairplot(iris)
>>> i = sns.JointGrid(x="x", y="y", data=data)
>>> i = i.plot(sns.regplot, sns.distplot)
>>> sns.jointplot("sepal_length", "sepal_width", data=iris, kind='kde')
```

Subplot grid for plotting pairwise relationships  
Plot pairwise bivariate distributions  
Grid for bivariate plot with marginal univariate plots

Plot bivariate distribution

### Categorical Plots

#### Scatterplot

```
>>> sns.stripplot(x="species", y="petal_length", data=iris)
>>> sns.swarmplot(x="species", y="petal_length", data=iris)
```

Scatterplot with one categorical variable

Categorical scatterplot with non-overlapping points

#### Bar Chart

```
>>> sns.barplot(x="sex", y="survived", hue="class", data=titanic)
```

Show point estimates and confidence intervals with scatterplot glyphs

#### Count Plot

```
>>> sns.countplot(x="deck", data=titanic, palette="Greens_d")
```

Show count of observations

#### Point Plot

```
>>> sns.pointplot(x="class", y="survived", hue="sex", data=titanic, palette={"male": "g", "female": "m"}, markers=["^", "o"], linestyle=["-", "--"])
```

Show point estimates and confidence intervals as rectangular bars

#### Boxplot

```
>>> sns.boxplot(x="alive", y="age", hue="adult_male", data=titanic)
>>> sns.boxplot(data=iris, orient="h")
```

Boxplot

Boxplot with wide-form data

#### Violinplot

```
>>> sns.violinplot(x="age", y="sex", hue="survived", data=titanic)
```

Violin plot

### Context Functions

```
>>> sns.set_context("talk")
>>> sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth":2.5})
```

Set context to "talk"  
Set context to "notebook", scale font elements and override param mapping

### Color Palette

```
>>> sns.set_palette("husl", 3)
>>> sns.color_palette("husl")
>>> flatui = ["#9b59b6", "#3498db", "#95a5a6", "#e74c3c", "#34495e", "#2ecc71"]
>>> sns.set_palette(flatui)
```

Define the color palette  
Use with `with` to temporarily set palette  
Set your own color palette

### Regression Plots

```
>>> sns.regplot(x="sepal_width", y="sepal_length", data=iris, ax=ax)
```

Plot data and a linear regression model fit

### Distribution Plots

```
>>> plot = sns.distplot(data.y, kde=False, color="b")
```

Plot univariate distribution

### Matrix Plots

```
>>> sns.heatmap(uniform_data, vmin=0, vmax=1)
```

Heatmap

## 4 Further Customizations

Also see [Matplotlib](#)

### Axisgrid Objects

```
>>> g.despine(left=True)
>>> g.set_ylabels("Survived")
>>> g.set_xticklabels(rotation=45)
>>> g.set_axis_labels("Survived", "Sex")
>>> h.set(xlim=(0, 5), ylim=(0, 5), xticks=[0, 2.5, 5], yticks=[0, 2.5, 5])
```

Remove left spine  
Set the labels of the y-axis  
Set the tick labels for x  
Set the axis labels  
Set the limit and ticks of the x-and y-axis

### Plot

```
>>> plt.title("A Title")
>>> plt.ylabel("Survived")
>>> plt.xlabel("Sex")
>>> plt.ylim(0,100)
>>> plt.xlim(0,10)
>>> plt.setp(ax, yticks=[0,5])
>>> plt.tight_layout()
```

Add plot title  
Adjust the label of the y-axis  
Adjust the label of the x-axis  
Adjust the limits of the y-axis  
Adjust the limits of the x-axis  
Adjust a plot property  
Adjust subplot params

## 5 Show or Save Plot

Also see [Matplotlib](#)

```
>>> plt.show()
>>> plt.savefig("foo.png")
>>> plt.savefig("foo.png", transparent=True)
```

Show the plot  
Save the plot as a figure  
Save transparent figure

### Close & Clear

Also see [Matplotlib](#)

```
>>> plt.cla()
>>> plt.clf()
>>> plt.close()
```

Clear an axis  
Clear an entire figure  
Close a window

