

Python For Data Science Cheat Sheet 3 Plotting With Seaborn

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

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")
```

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

```
>>> h.set(xlim=(0, 5),
        ylim=(0, 5),
        xticks=[0, 2.5, 5],
        yticks=[0, 2.5, 5])
```

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

