Introduction to Seaborn

INTERMEDIATE DATA VISUALIZATION WITH SEABORN

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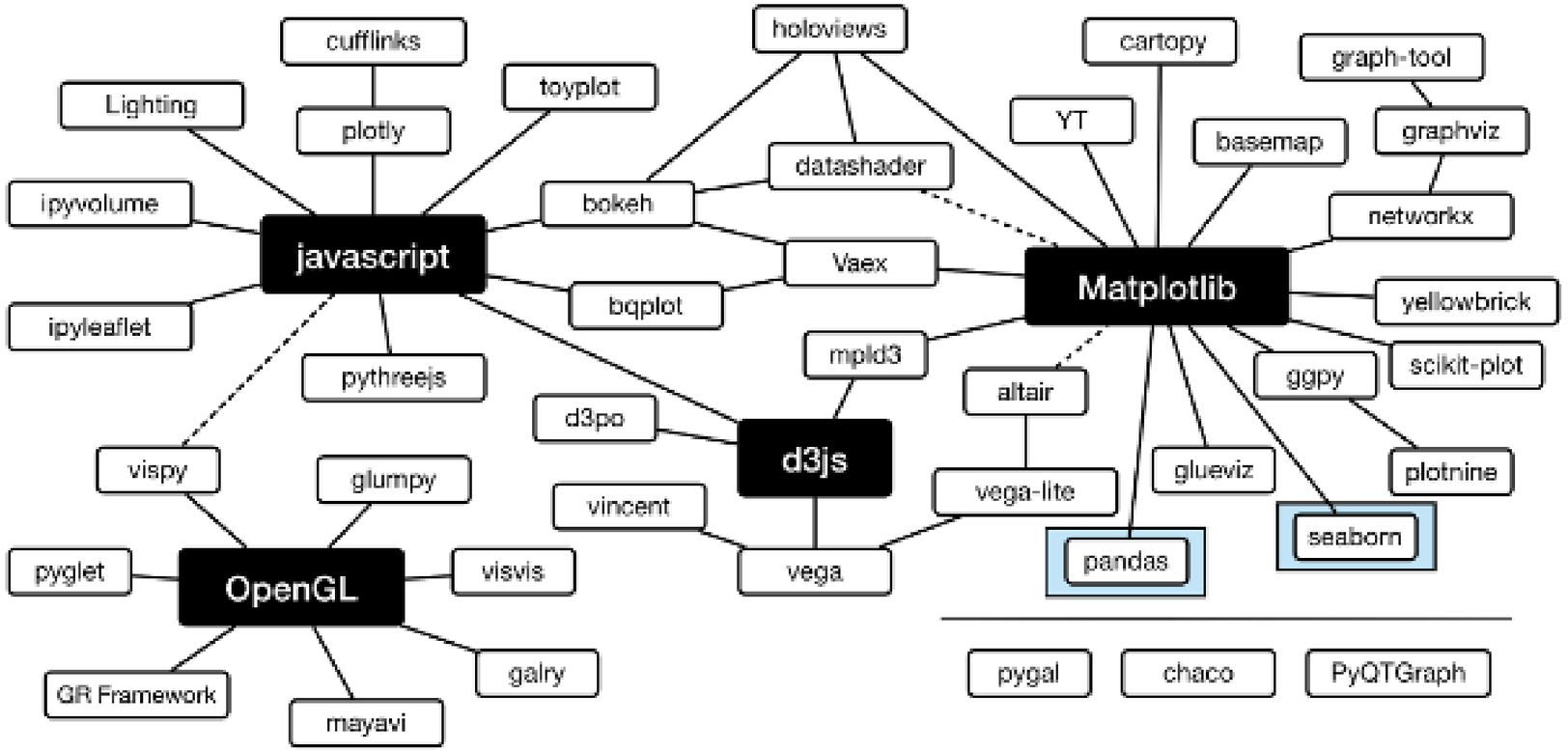
Instructor

Python Visualization Landscape

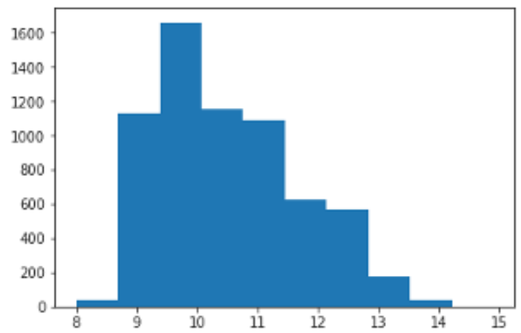
- The python visualization landscape is complex and can be overwhelming



Matplotlib

- `matplotlib` provides the raw building blocks for Seaborn's visualizations
- It can also be used on its own to plot data

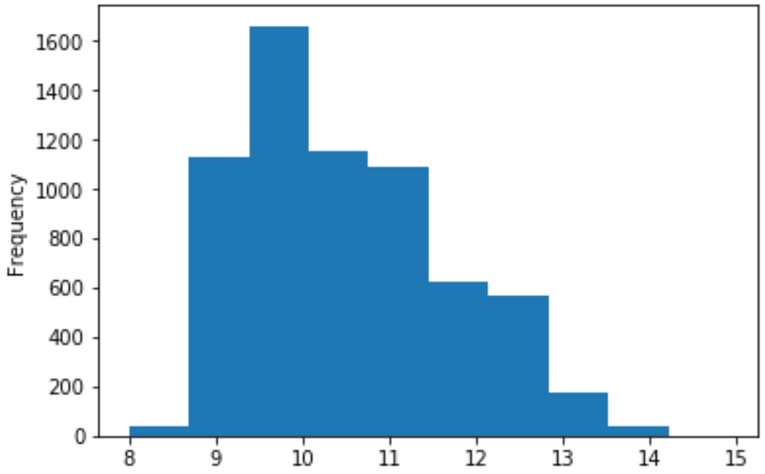
```
import matplotlib.pyplot as plt
import pandas as pd
df = pd.read_csv("wines.csv")
fig, ax = plt.subplots()
ax.hist(df['alcohol'])
```



Pandas

- `pandas` is a foundational library for analyzing data
- It also supports basic plotting capability

```
import pandas as pd
df = pd.read_csv("wines.csv")
df['alcohol'].plot.hist()
```



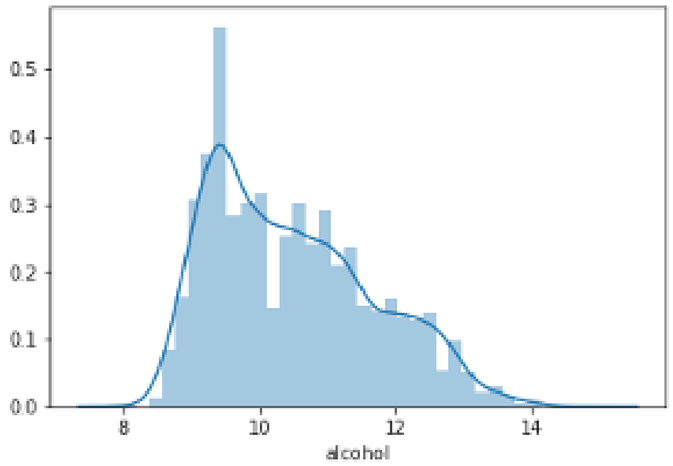
Seaborn

- Seaborn supports complex visualizations of data
- It is built on matplotlib and works best with pandas' dataframes

Seaborn

- The `distplot` is similar to the histogram shown in previous examples
- By default, generates a Gaussian Kernel Density Estimate (KDE)

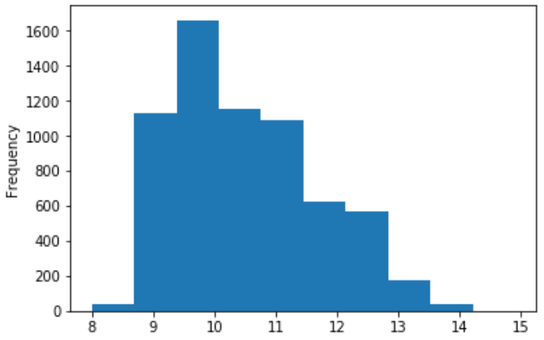
```
import seaborn as sns
sns.distplot(df['alcohol'])
```



Histogram vs. Distplot

- Pandas histogram

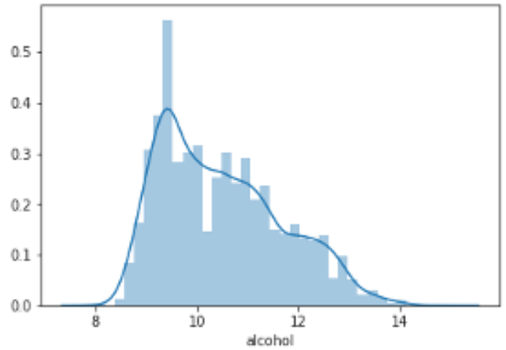
```
df['alcohol'].plot.hist()
```



  - Actual frequency of observations
  - No automatic labels
  - Wide bins

- Seaborn distplot

```
sns.distplot(df['alcohol'])
```



  - Automatic label on x axis
  - Muted color palette
  - KDE plot
  - Narrow bins

Let's practice!

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Using the distribution plot

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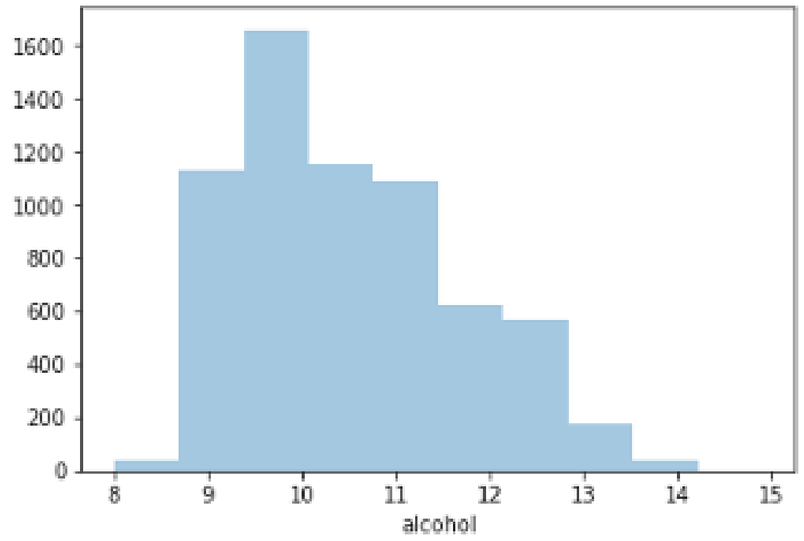
Creating a histogram

- Distplot function has multiple optional arguments
- In order to plot a simple histogram, you can disable the kde and specify the number of bins to use

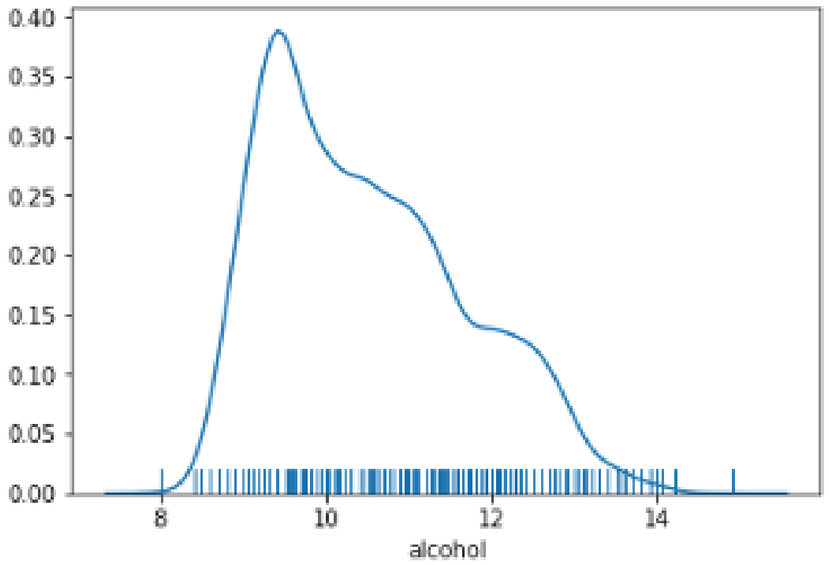
```
sns.distplot(df['alcohol'], kde=False, bins=10)
```



Alternative data distributions

- A rug plot is an alternative way to view the distribution of data
- A kde curve and rug plot can be combined

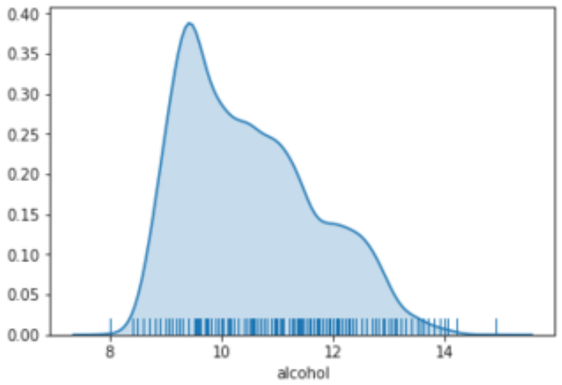
```
sns.distplot(df_wines['alcohol'], hist=False, rug=True)
```



Further Customizations

- The `distplot` function uses several functions including `kdeplot` and `rugplot`
- It is possible to further customize a plot by passing arguments to the underlying function

```
sns.distplot(df_wines['alcohol'], hist=False,
             rug=True, kde_kws={'shade':True})
```



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Regression Plots in Seaborn

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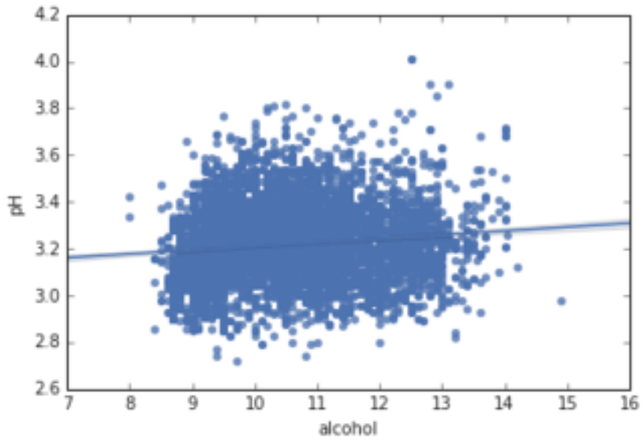
Introduction to regplot

- The `regplot` function generates a scatter plot with a regression line
- Usage is similar to the `distplot`
- The `data` and `x` and `y` variables must be defined

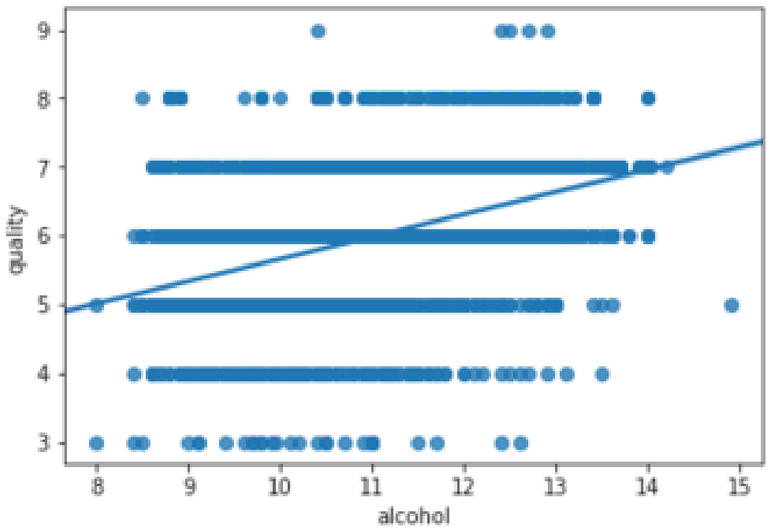
```
sns.regplot(x="alcohol", y="pH", data=df)
```



lmplot() builds on top of the base regplot()

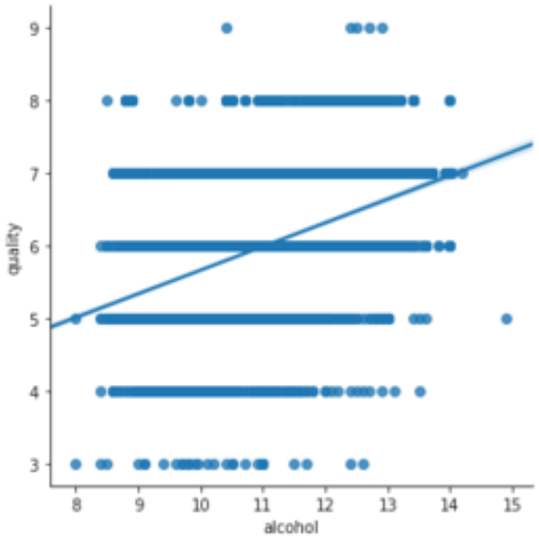
- `regplot` - low level

```
sns.regplot(x="alcohol",
            y="quality",
            data=df)
```



- `lmplot` - high level

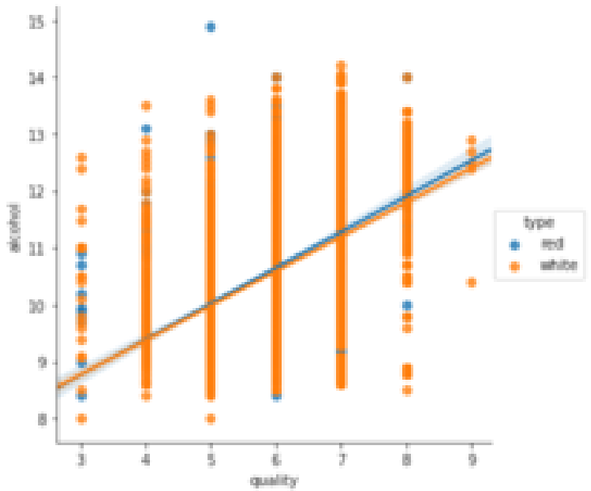
```
sns.lmplot(x="alcohol",
           y="quality",
           data=df)
```



lmplot faceting

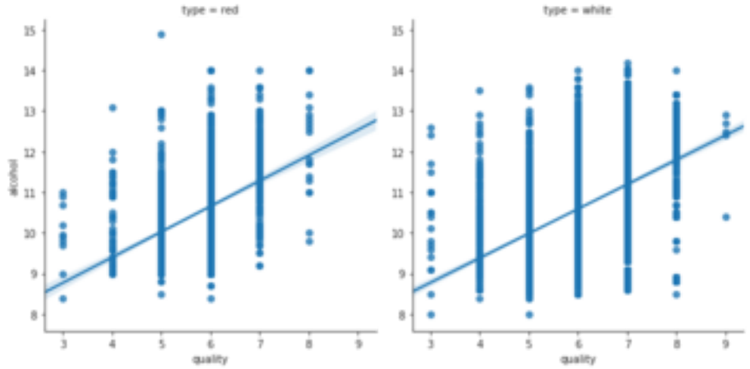
- Organize data by colors (`hue`)

```
sns.lmplot(x="quality",
           y="alcohol",
           data=df,
           hue="type")
```



- Organize data by columns (`col`)

```
sns.lmplot(x="quality",
           y="alcohol",
           data=df,
           col="type")
```



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