Changing plot style and color

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Erin CaseData Scientist



Why customize?

Reasons to change style:

- Personal preference
- Improve readability
- Guide interpretation



Changing the figure style

- Figure "style" includes background and axes
- Preset options: "white", "dark", "whitegrid", "darkgrid", "ticks"
- sns.set_style()

Default figure style ("white")

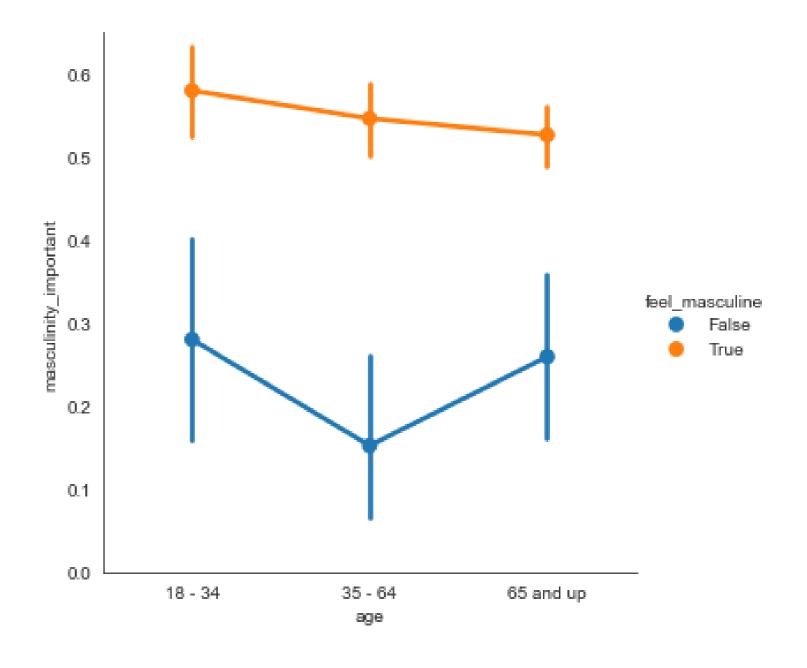
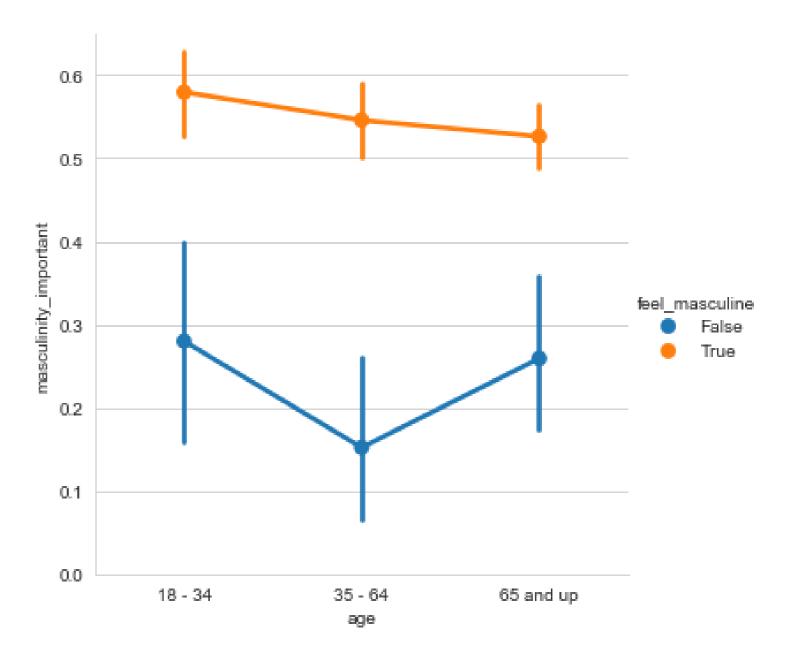
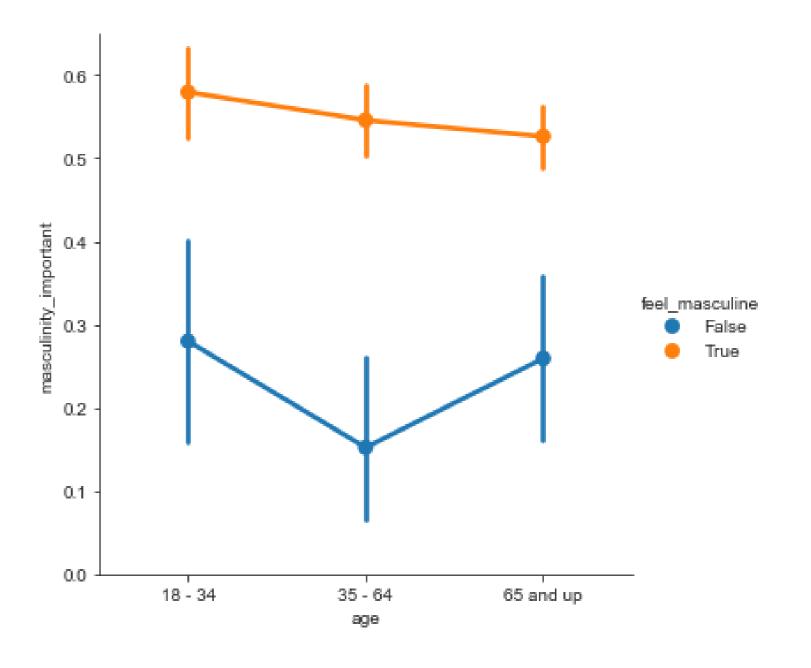


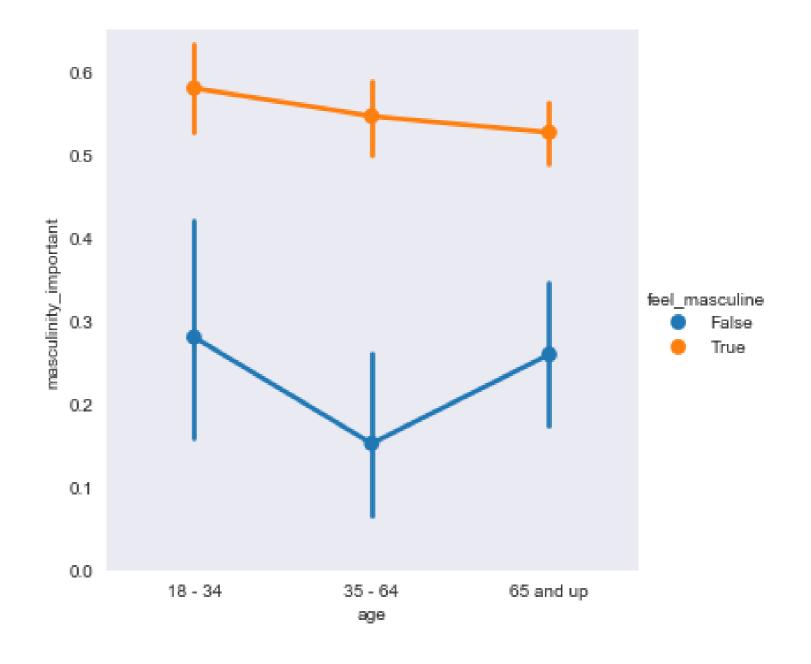
Figure style: "whitegrid"



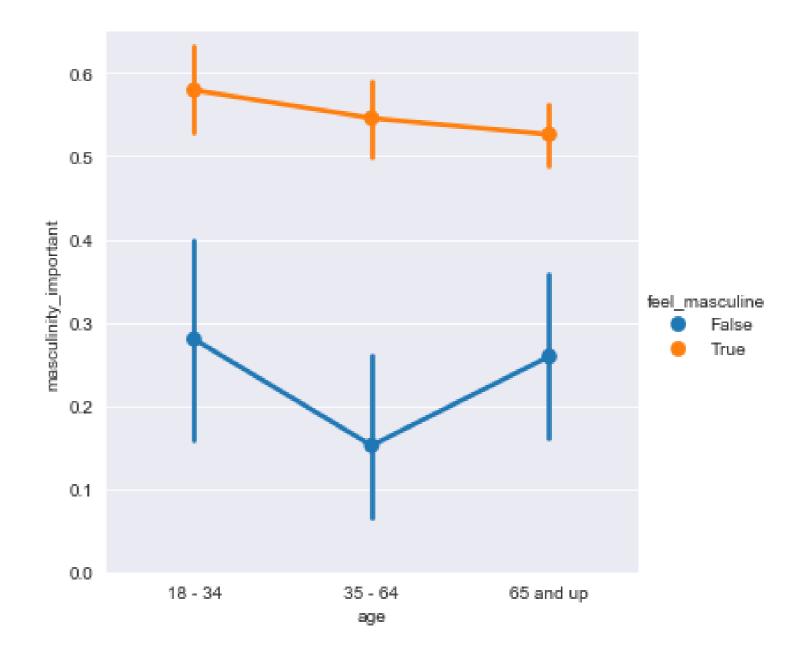
Other styles



Other styles



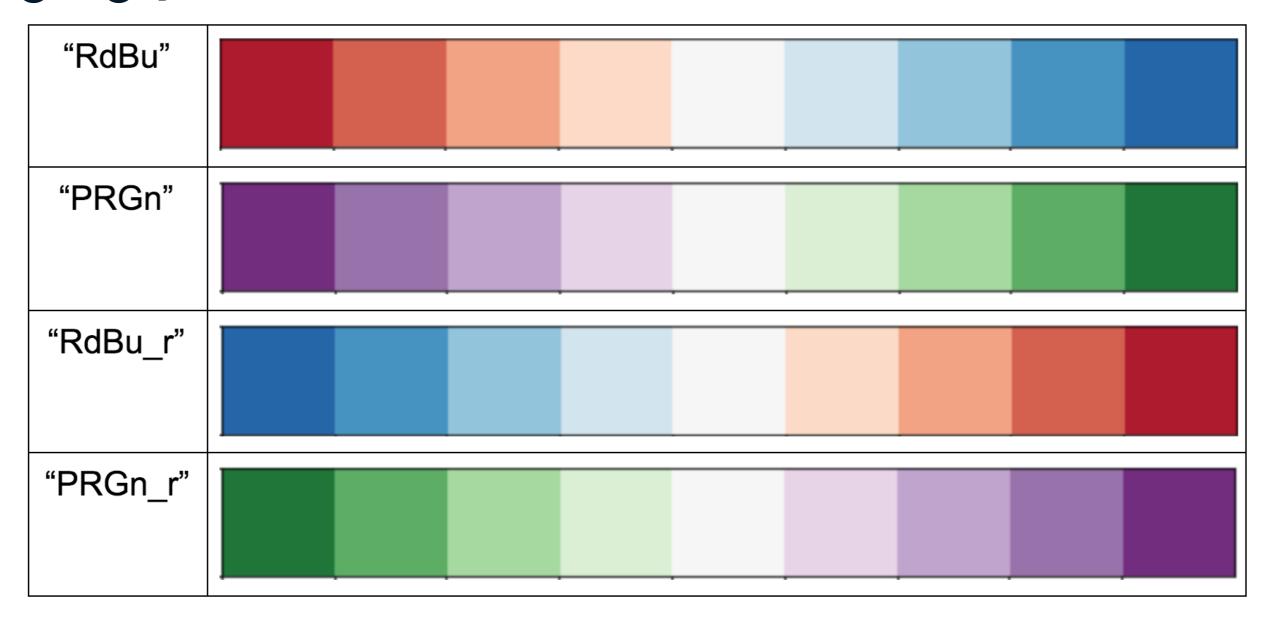
Other styles



Changing the palette

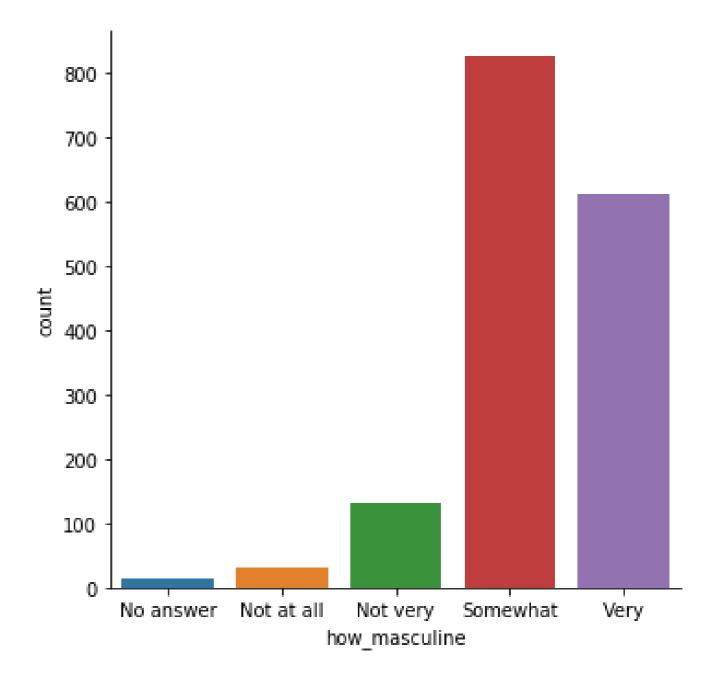
- Figure "palette" changes the color of the main elements of the plot
- sns.set_palette()
- Use preset palettes or create a custom palette

Diverging palettes



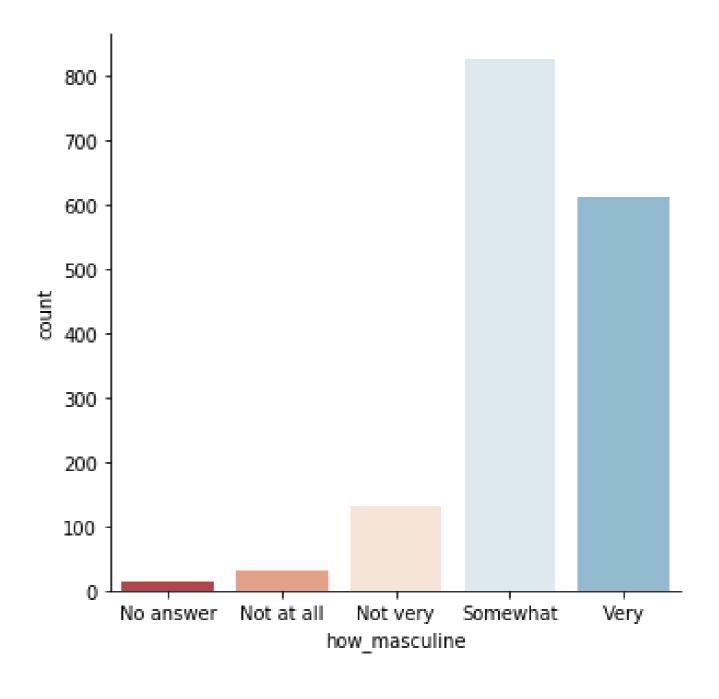
Example (default palette)

```
category_order = ["No answer",
                  "Not at all",
                  "Not very",
                  "Somewhat",
                  "Very"]
sns.catplot(x="how_masculine",
            data=masculinity_data,
            kind="count",
            order=category_order)
plt.show()
```



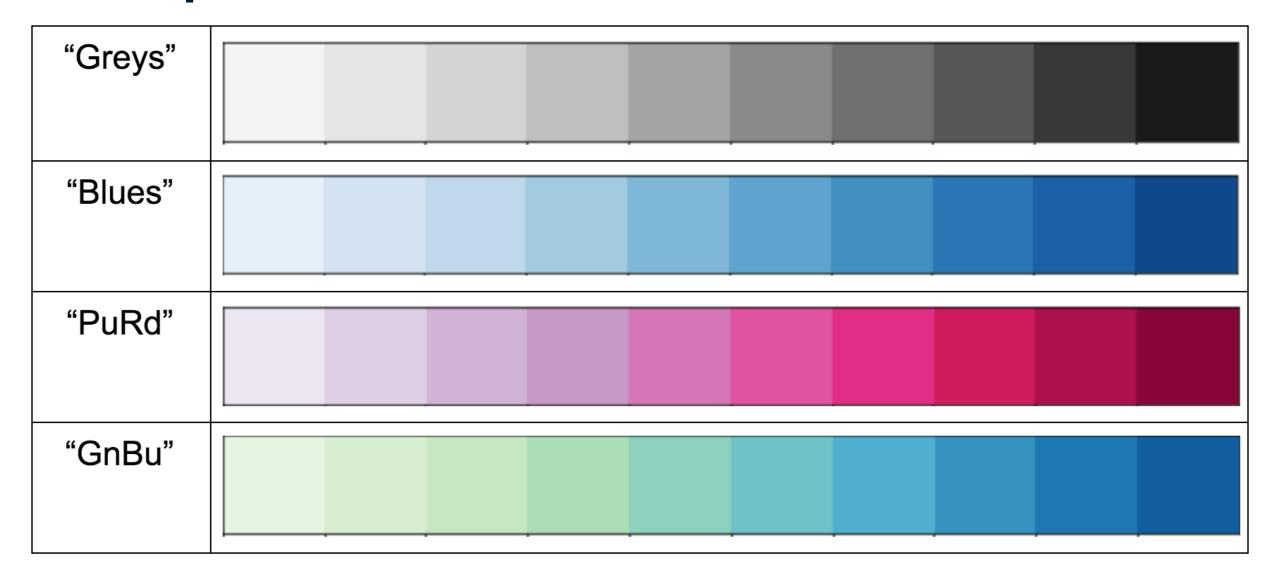
Example (diverging palette)

```
sns.set_palette("RdBu")
category_order = ["No answer",
                  "Not at all",
                  "Not very",
                  "Somewhat",
                  "Very"]
sns.catplot(x="how_masculine",
            data=masculinity_data,
            kind="count",
            order=category_order)
plt.show()
```

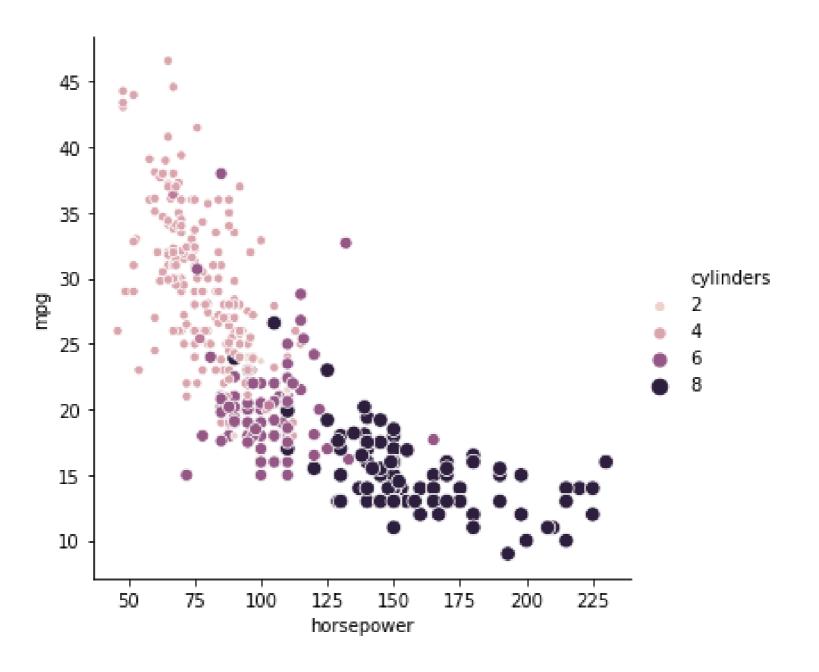




Sequential palettes



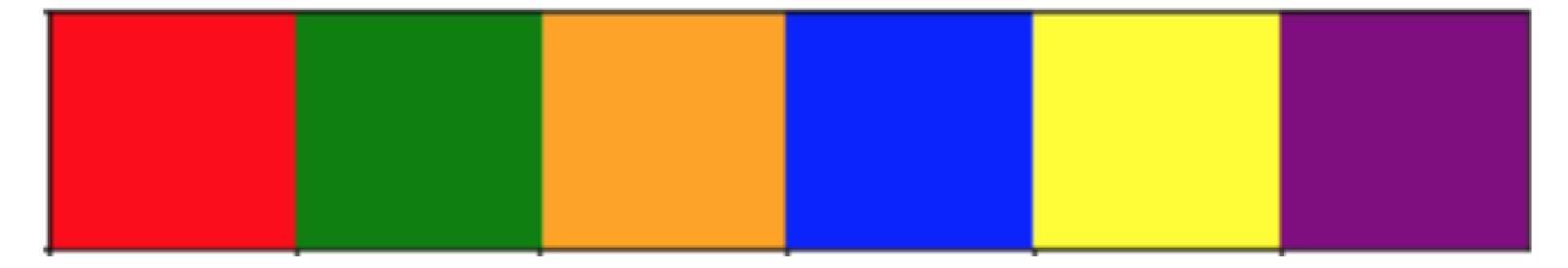
Sequential palette example



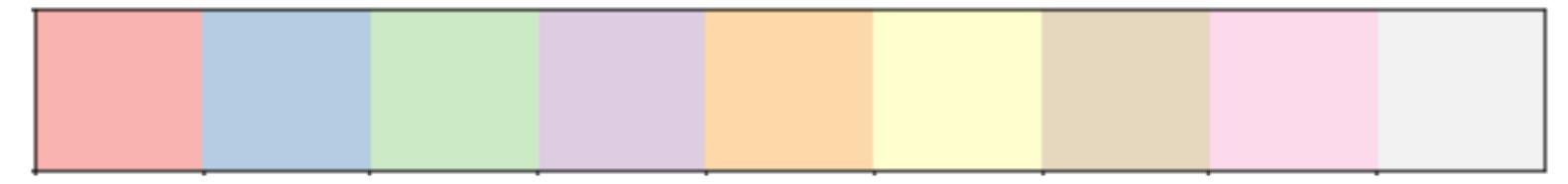
¹ Waskom, M. L. (2021). seaborn: statistical data visualization. https://seaborn.pydata.org/



Custom palettes



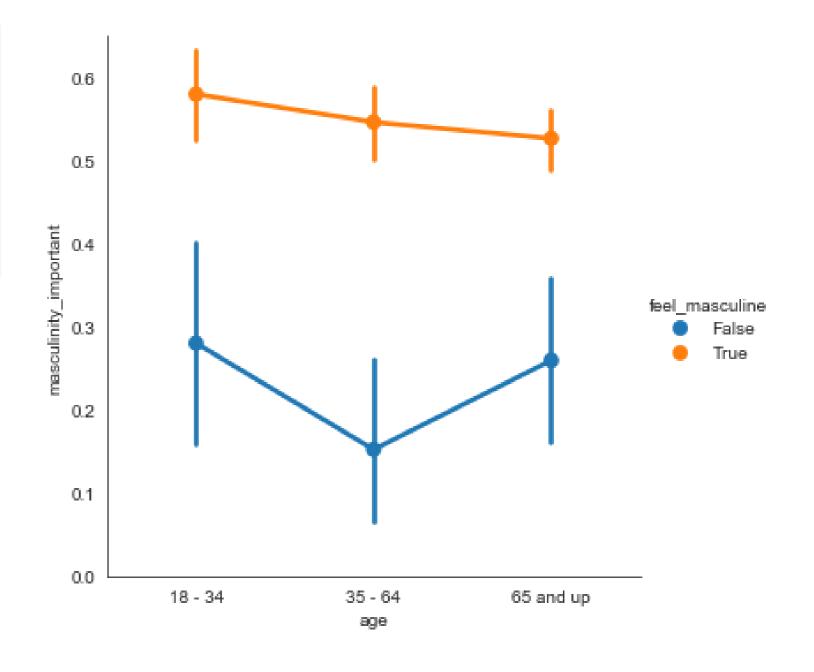
Custom palettes



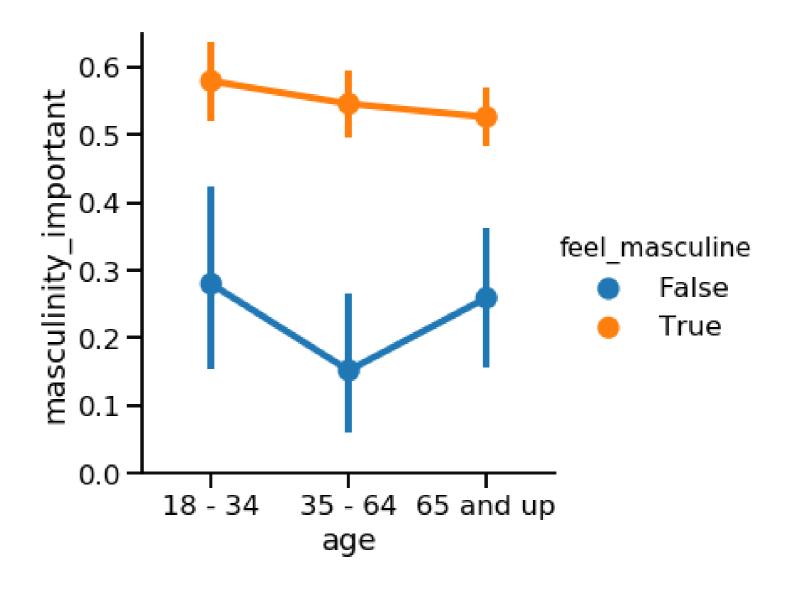
Changing the scale

- Figure "context" changes the scale of the plot elements and labels
- sns.set_context()
- Smallest to largest: "paper", "notebook", "talk", "poster"

Default context: "paper"



Larger context: "talk"



Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Adding titles and labels: Part 1

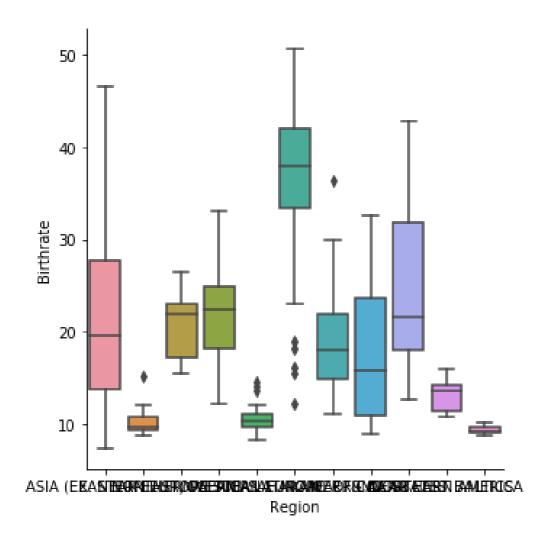
INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

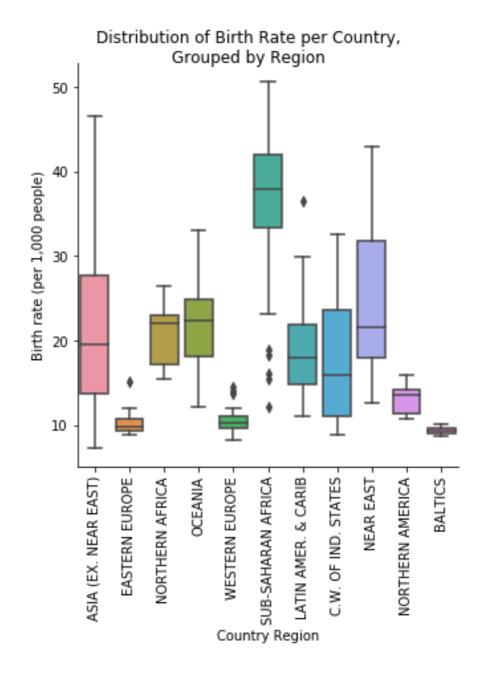


Erin CaseData Scientist



Creating informative visualizations





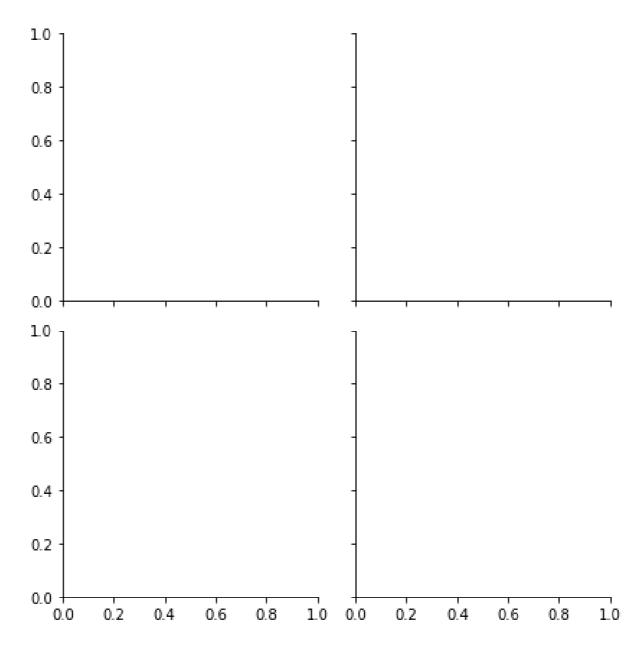
FacetGrid vs. AxesSubplot objects

Seaborn plots create two different types of objects: FacetGrid and AxesSubplot

```
g = sns.scatterplot(x="height", y="weight", data=df)
type(g)
```

> matplotlib.axes._subplots.AxesSubplot

An Empty FacetGrid

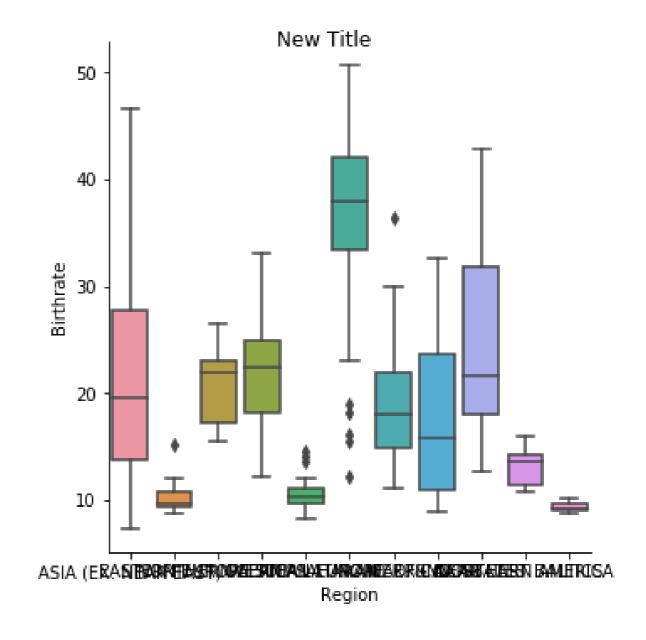




FacetGrid vs. AxesSubplot objects

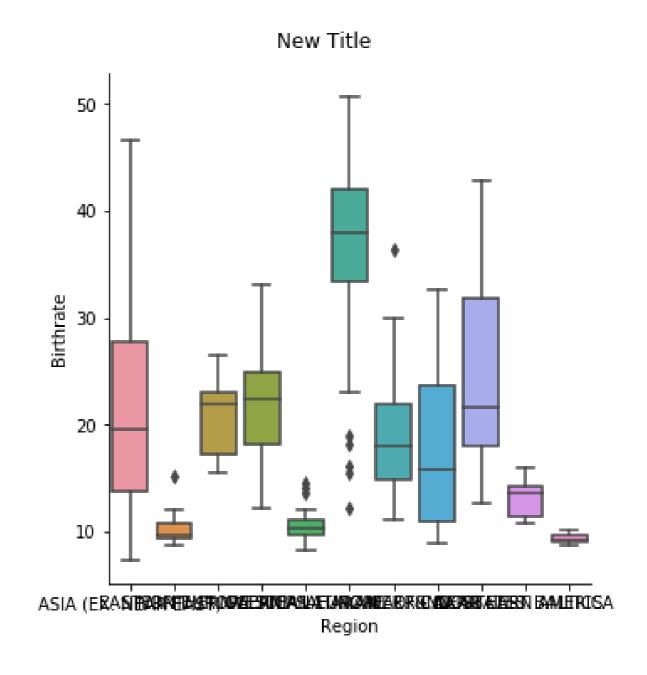
Object Type	Plot Types	Characteristics
FacetGrid	relplot(), catplot()	Can create subplots
AxesSubplot	<pre>scatterplot() , countplot() , etc.</pre>	Only creates a single plot

Adding a title to FacetGrid



Adjusting height of title in FacetGrid

```
sns.catplot(x="Region",
                y="Birthrate",
                data=gdp_data,
                kind="box")
g.fig.suptitle("New Title",
               y=1.03)
plt.show()
```



Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Adding titles and labels: Part 2

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Erin CaseData Scientist

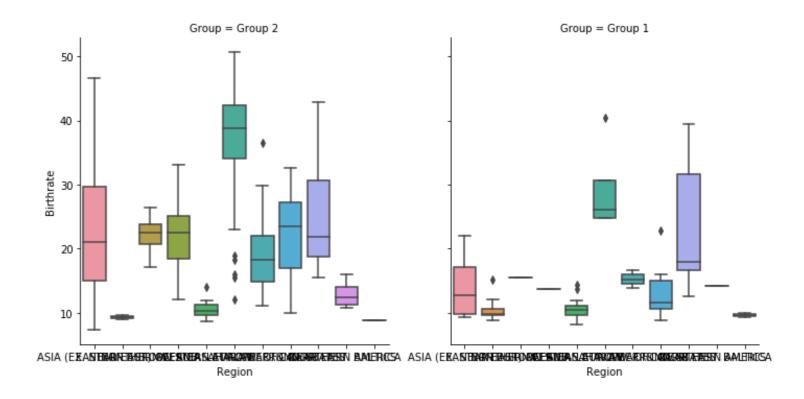


Adding a title to AxesSubplot

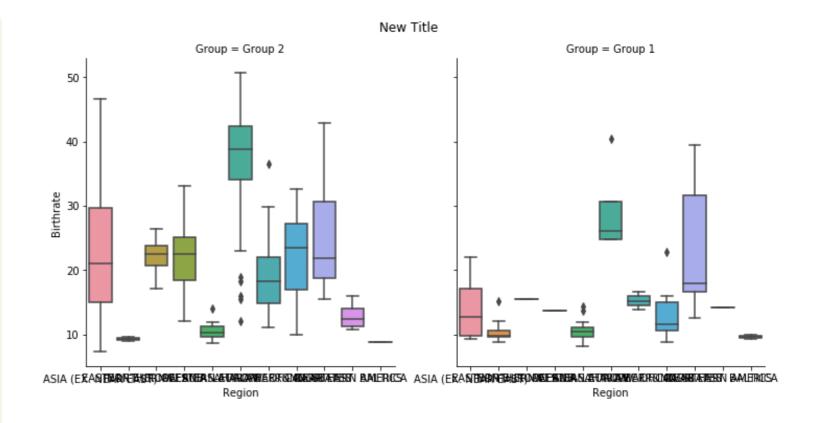
FacetGrid

AxesSubplot

Titles for subplots

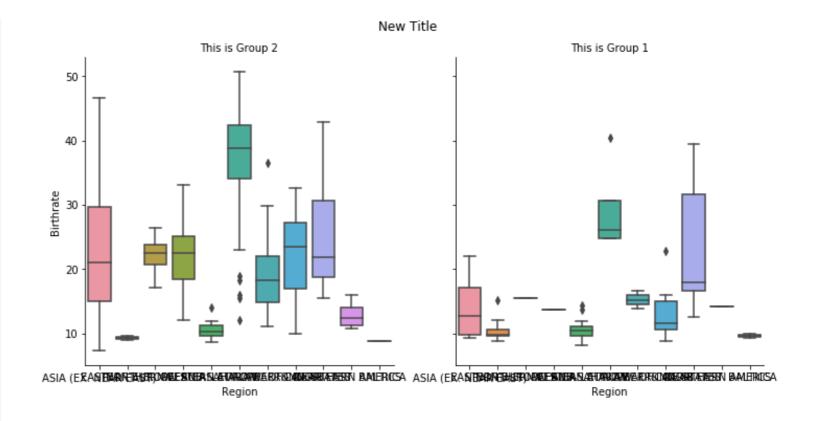


Titles for subplots



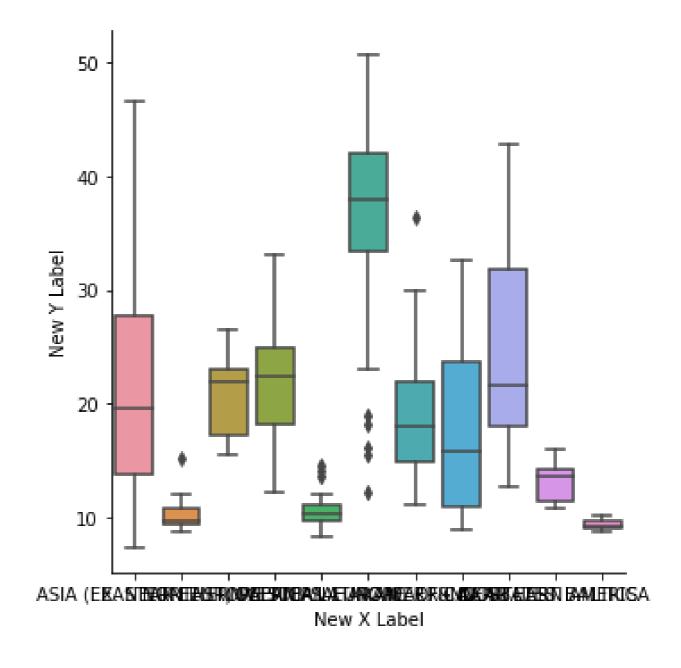
Titles for subplots

```
= sns.catplot(x="Region",
                y="Birthrate",
                data=gdp_data,
                kind="box",
                col="Group")
g.fig.suptitle("New Title",
               y=1.03)
g.set_titles("This is {col_name}")
```

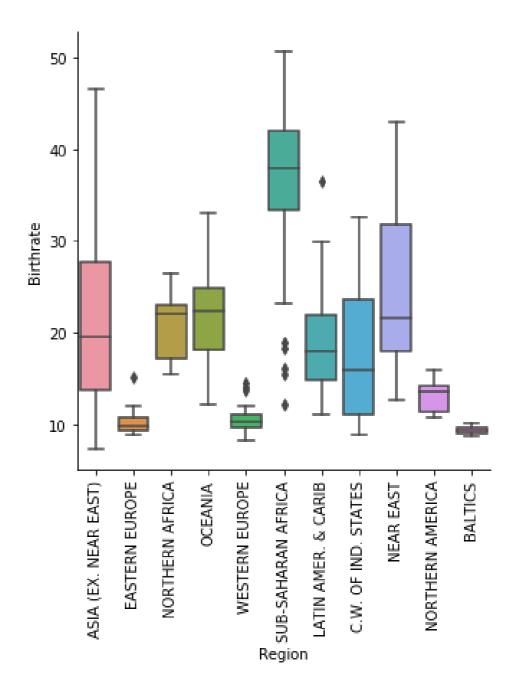


Adding axis labels

```
= sns.catplot(x="Region",
                y="Birthrate",
                data=gdp_data,
                kind="box")
g.set(xlabel="New X Label",
      ylabel="New Y Label")
plt.show()
```



Rotating x-axis tick labels



Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Putting it all together

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Erin CaseData Scientist



Getting started

To import Seaborn:

```
import seaborn as sns
```

To import Matplotlib:

```
import matplotlib.pyplot as plt
```

To show a plot:

```
plt.show()
```



Relational plots

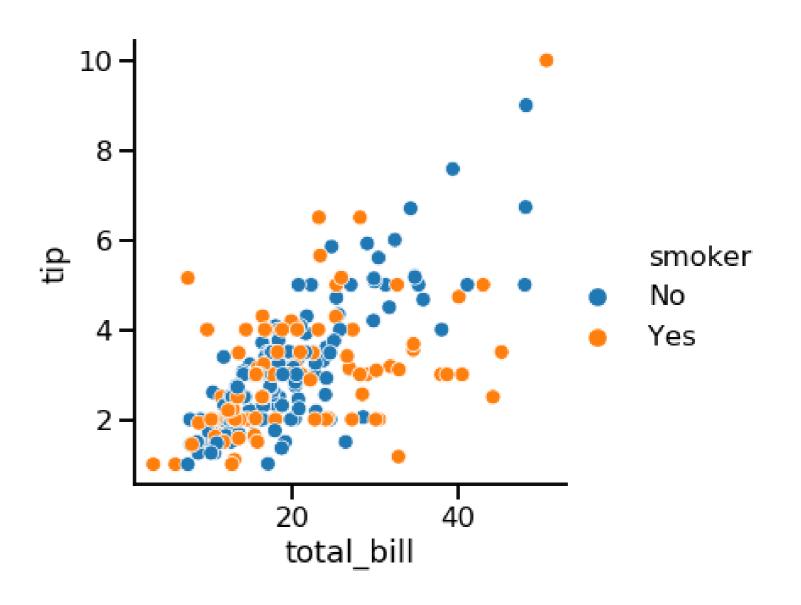
- Show the relationship between two quantitative variables
- Examples: scatter plots, line plots

Categorical plots

- Show the distribution of a quantitative variable within categories defined by a categorical variable
- Examples: bar plots, count plots, box plots, point plots

Adding a third variable (hue)

Setting hue will create subgroups that are displayed as different colors on a single plot.

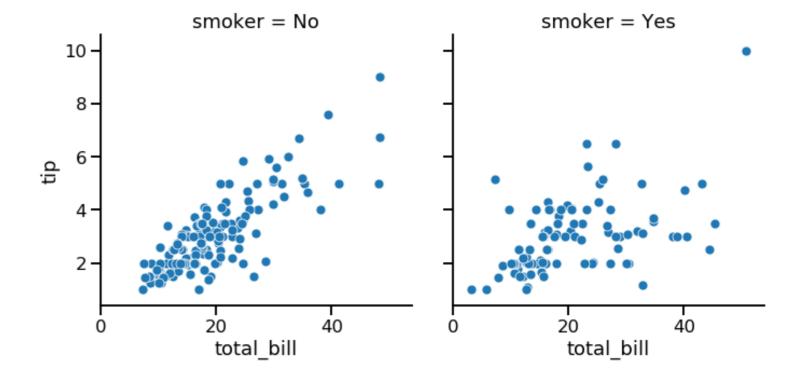


¹ Waskom, M. L. (2021). seaborn: statistical data visualization. https://seaborn.pydata.org/



Adding a third variable (row/col)

Setting row and/or col in relplot() or catplot() will create subgroups that are displayed on separate subplots.



¹ Waskom, M. L. (2021). seaborn: statistical data visualization. https://seaborn.pydata.org/



Customization

- Change the background: sns.set_style()
- Change the main element colors: sns.set_palette()
- Change the scale: sns.set_context()

Adding a title

Object Type	Plot Types	How to Add Title
FacetGrid	relplot(), catplot()	<pre>g.fig.suptitle()</pre>
AxesSubplot	<pre>scatterplot() , countplot() , etc.</pre>	<pre>g.set_title()</pre>

Final touches

Add x- and y-axis labels:

```
g.set(xlabel="new x-axis label",
   ylabel="new y-axis label")
```

Rotate x-tick labels:

```
plt.xticks(rotation=90)
```

Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Well done! What's next?

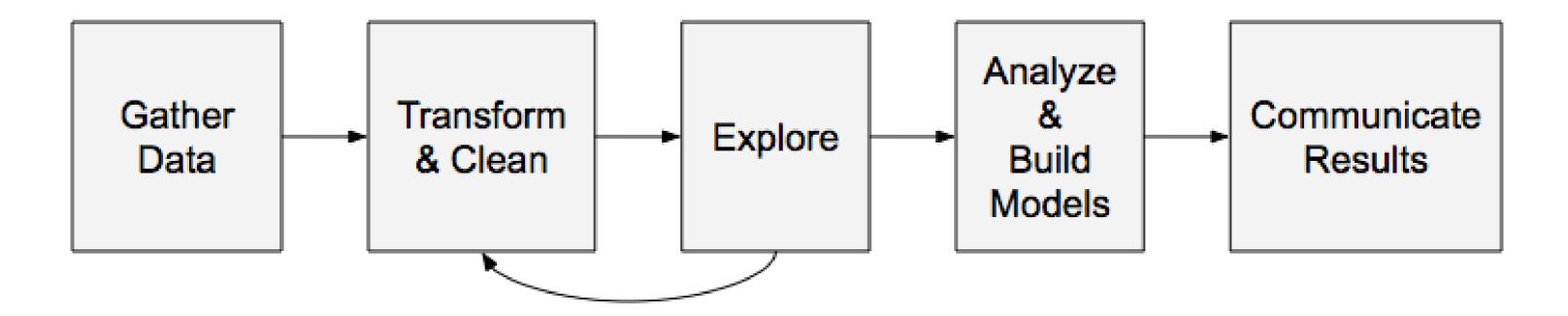
INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



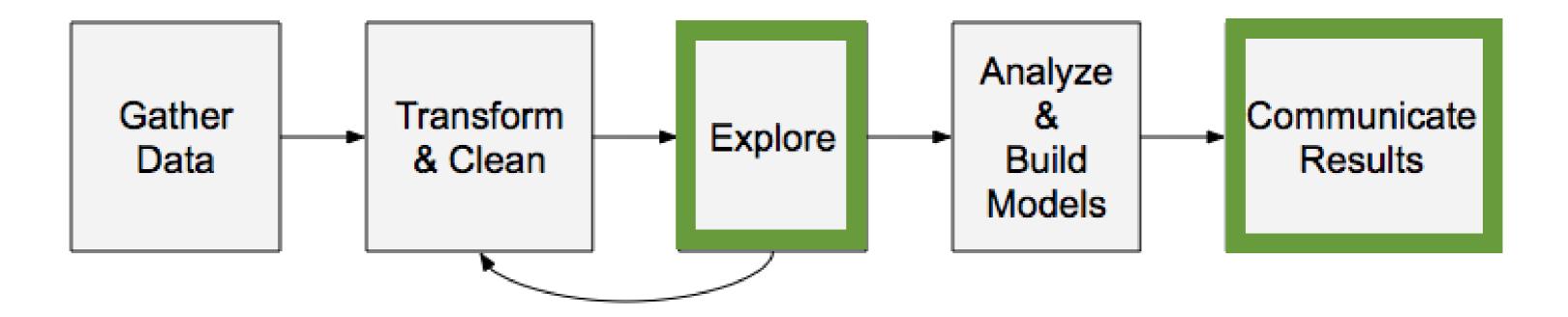
Erin CaseData Scientist



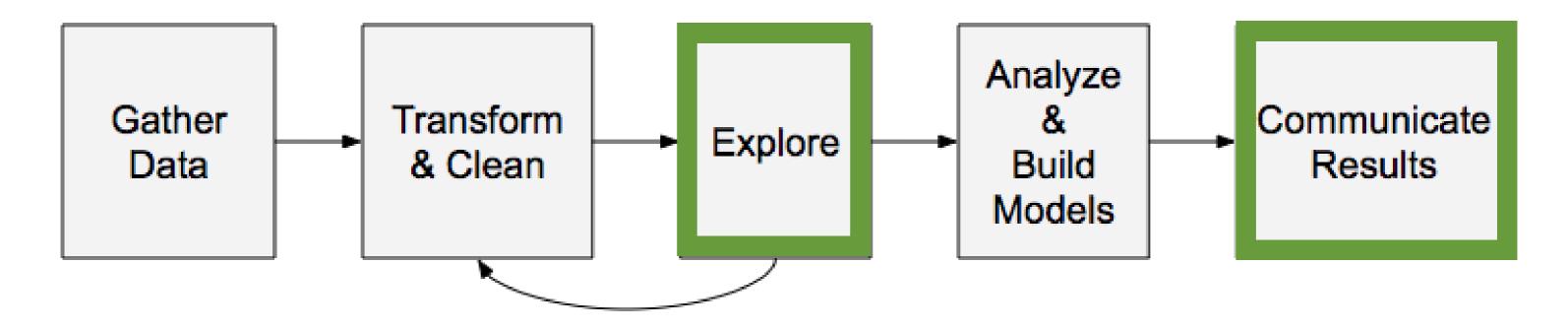
Where does Seaborn fit in?



Where does Seaborn fit in?

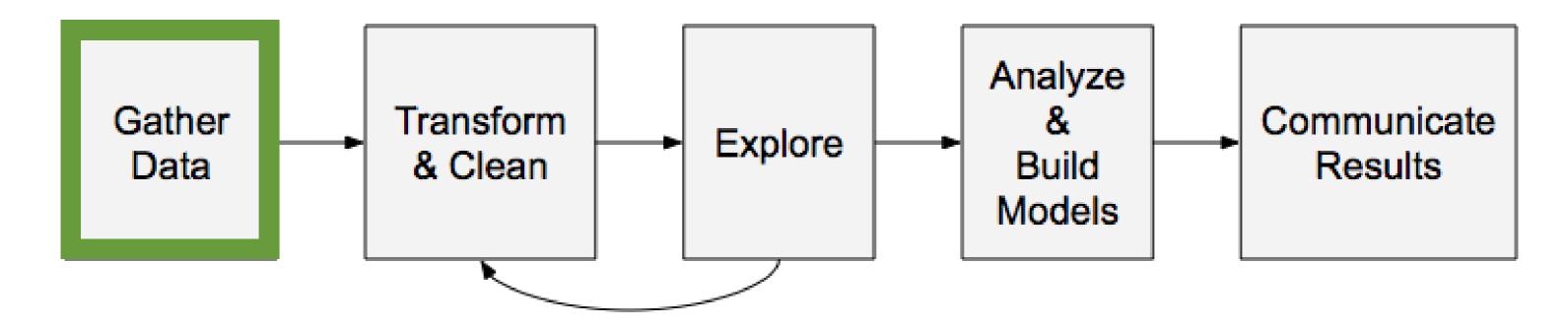


Next Steps: Explore and communicate results



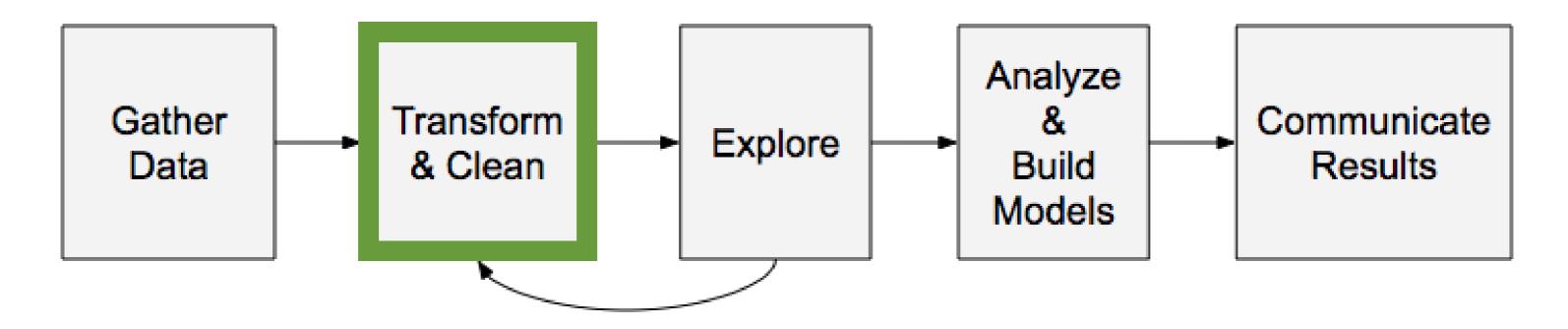
- Seaborn advanced visualizations
- Matplotlib advanced customizations

Next steps: Gather data



- Python
- SQL

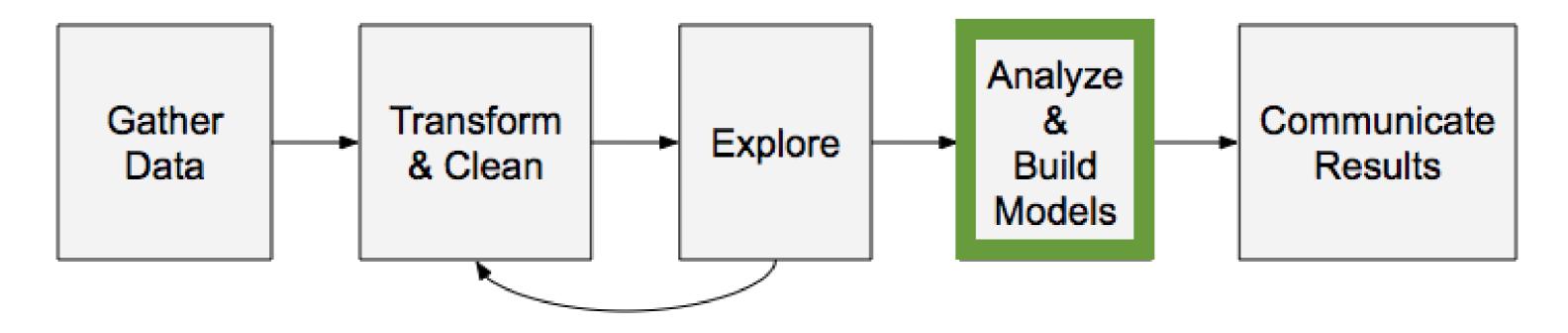
Next steps: Transform and clean



- Getting data into pandas DataFrames
- Cleaning data
- Transforming into tidy format



Next steps: Analyze and build models



- Statistical analysis
- Calculating and interpreting confidence intervals

Congratulations!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

