Data Visualization with Matplotlib and Seaborn

Agenda

- What is Data Visualization
- Matplotlib and Seaborn
- Distribution Plots
- Categorical Plots
- Matrix Plots
- Regression Plots
- Color palettes
- Change Plot Size

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What is Data Visualization

Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data.

Our eyes are drawn to colors and patterns. We can quickly identify red from blue, square from circle. Our culture is visual, including everything from art and advertisements to TV and movies.

Data visualization is another form of visual art that grabs our interest and keeps our eyes on the message.

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Matplotlib and Seaborn

Seaborn and Matplotlib are two of Python's most powerful visualization libraries. Seaborn is built on top of matplotlib so it's more like a wrapper, Seaborn uses fewer syntax and has stunning default themes and Matplotlib is more easily customizable through accessing the classes.

We will focus on Seaborn as we know it's so much easier and give you a lot of out-of-the-box plots.

https://matplotlib.org/gallery/index.html

https://seaborn.pydata.org/index.html

Matplotlib and Seaborn

Install

```
1 >_ conda install matplotlib
2 >_ conda install seaborn
```

Use

```
1 import matplotlib.pyplot as plt
2 import seaborn as sns
```

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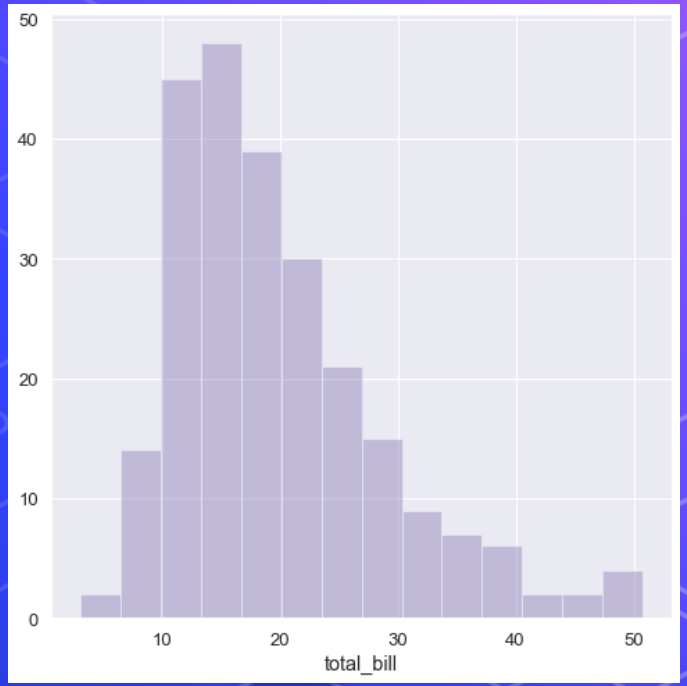
Distribution Plots

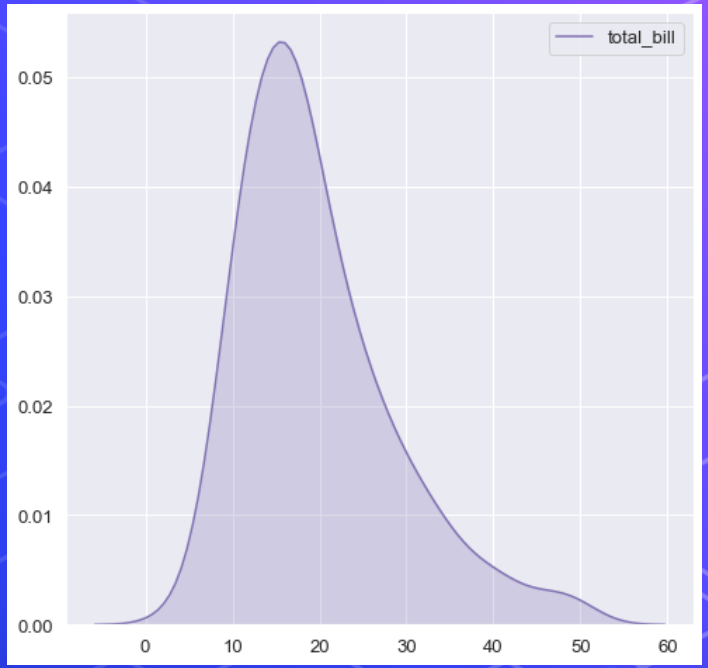
- Univariate Plots
  - **distplot**
  - kdeplot
- Bivariate Plots
  - jointplot
  - pairplot




```
1 sns.distplot(tips['total_bill'])
```

Distribution Plots

- Univariate Plots
  - `distplot`
  - **`kdeplot`**
- Bivariate Plots
  - `jointplot`
  - `pairplot`




```
1 sns.kdeplot(tips['total_bill'], shade=True)
```

Distribution Plots

- Univariate Plots
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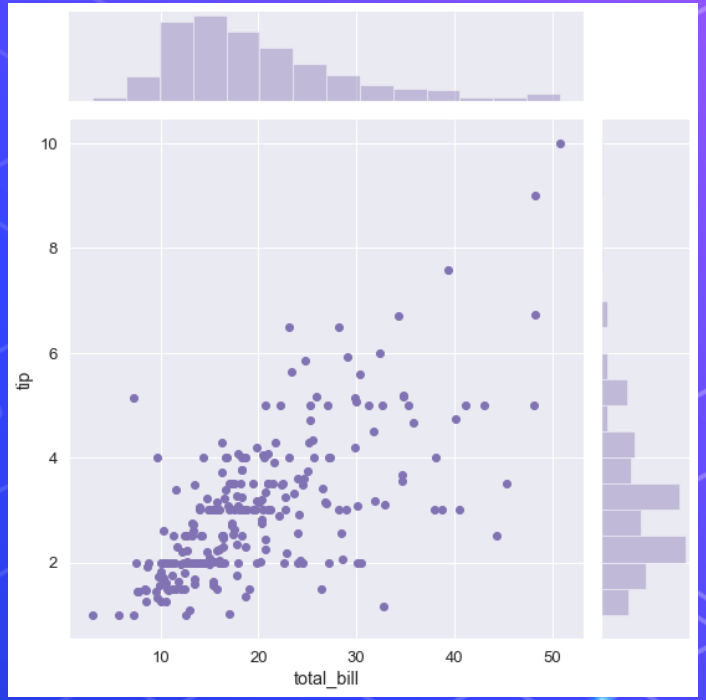
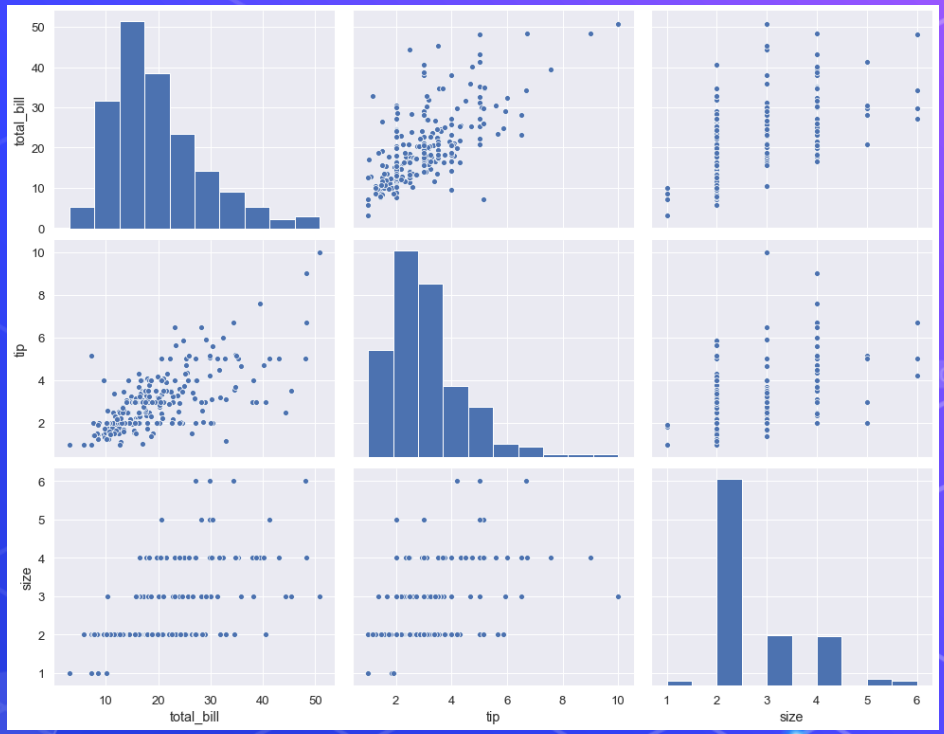



```
1 sns.jointplot(x='total_bill', y='tip', data=tips, kind='scatter')
```

Distribution Plots

- Univariate Plots
  - `distplot`
  - `kdeplot`
- Bivariate Plots
  - `jointplot`
  - **`pairplot`**




```
1 sns.pairplot(tips)
```

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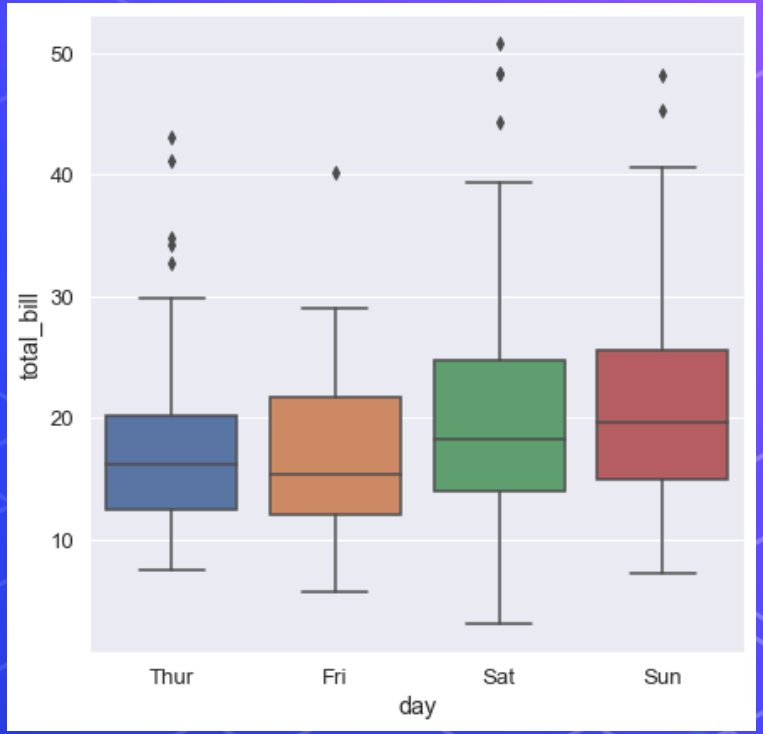
Categorical Plots

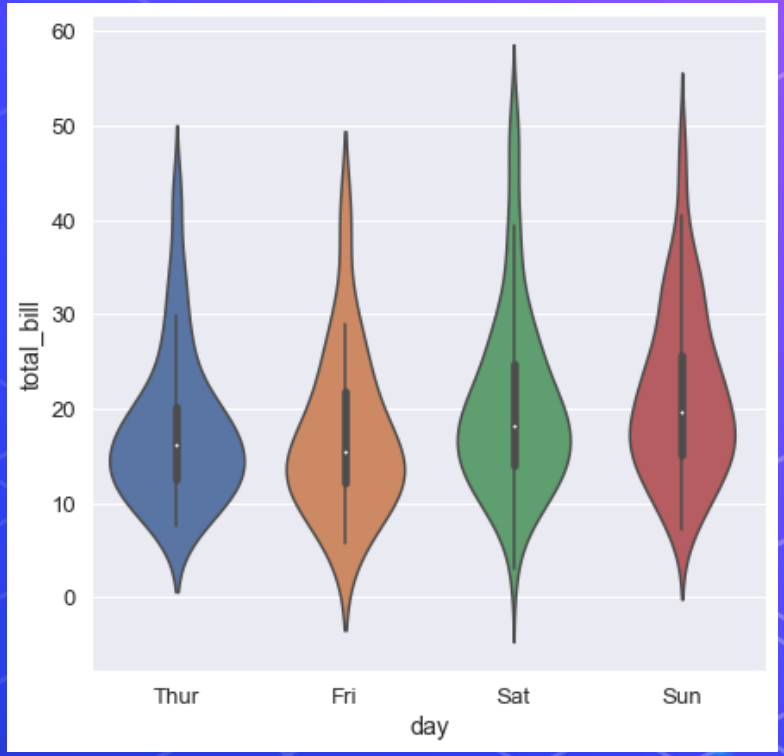
- Categorical Distribution Plots
  - **boxplot**
  - violinplot
- Categorical Scatter Plots
  - stripplot
  - swarmplot
- Categorical Estimate Plots
  - barplot
  - countplot




```
1 sns.boxplot(x="day", y="total_bill", data=tips)
```

Categorical Plots

- Categorical Distribution Plots
  - `boxplot`
  - **`violinplot`**
- Categorical Scatter Plots
  - `stripplot`
  - `swarmplot`
- Categorical Estimate Plots
  - `barplot`
  - `countplot`




```
1 sns.violinplot(x="day", y="total_bill", data=tips)
```

Categorical Plots

- Categorical Distribution Plots
  - `boxplot`
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- Categorical Scatter Plots
  - **`stripplot`**
  - `swarmplot`
- Categorical Estimate Plots
  - `barplot`
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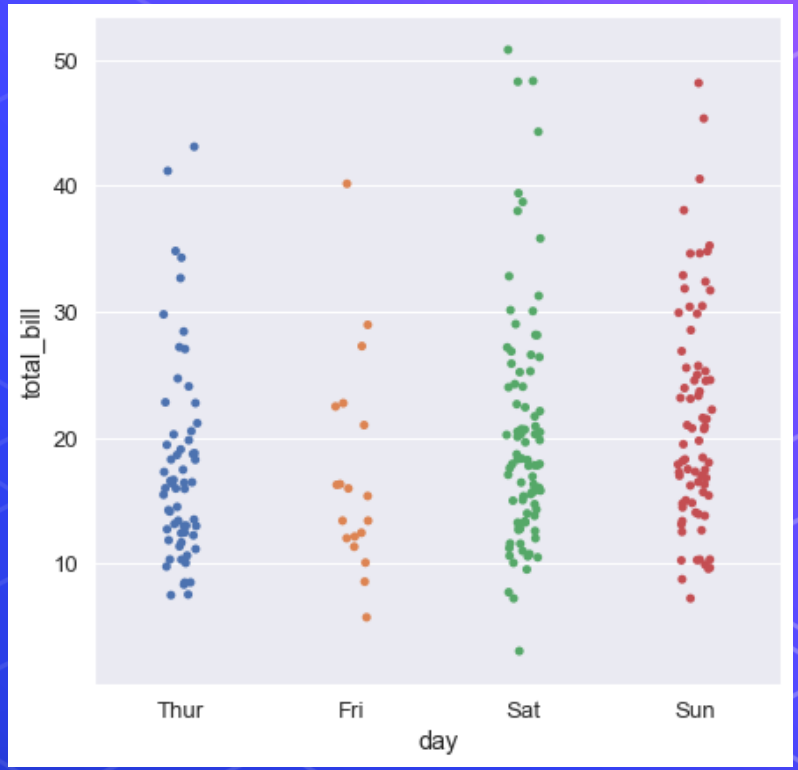


```
1 sns.stripplot(x="day", y="total_bill", data=tips)
```

Categorical Plots

- Categorical Distribution Plots
  - `boxplot`
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  - `stripplot`
  - **`swarmplot`**
- Categorical Estimate Plots
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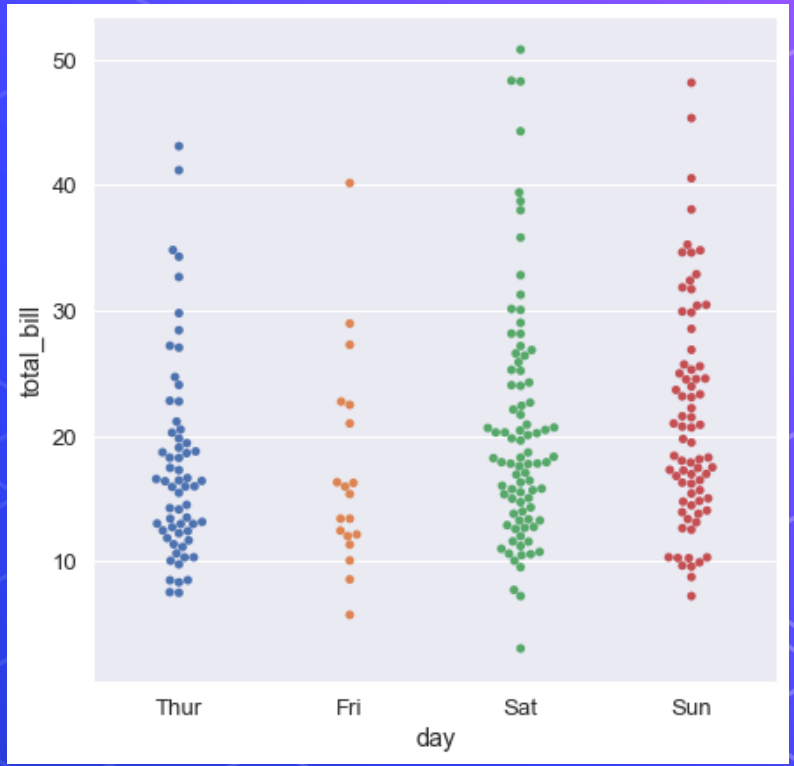


```
1 sns.swarmplot(x="day", y="total_bill", data=tips)
```

Categorical Plots

- Categorical Distribution Plots
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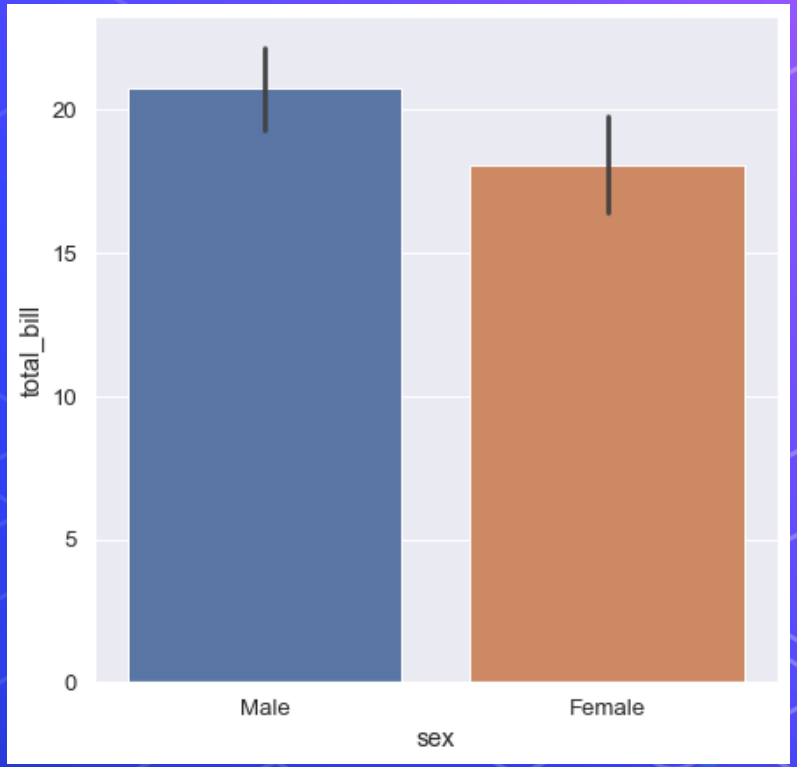


```
1 sns.barplot(x='sex', y='total_bill', data=tips)
```

Categorical Plots

- Categorical Distribution Plots
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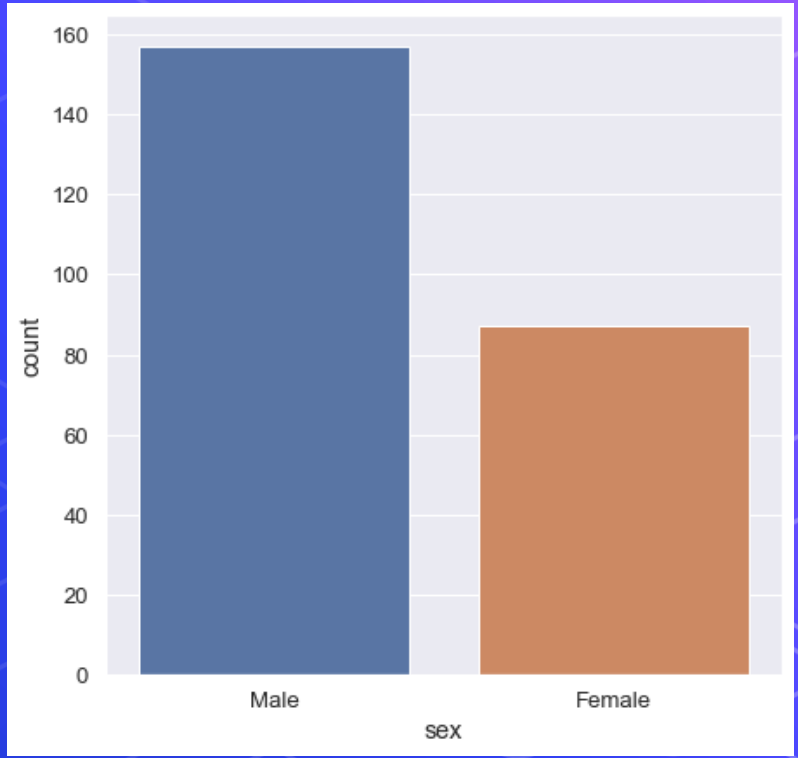


```
1 sns.countplot(x='sex', data=tips)
```

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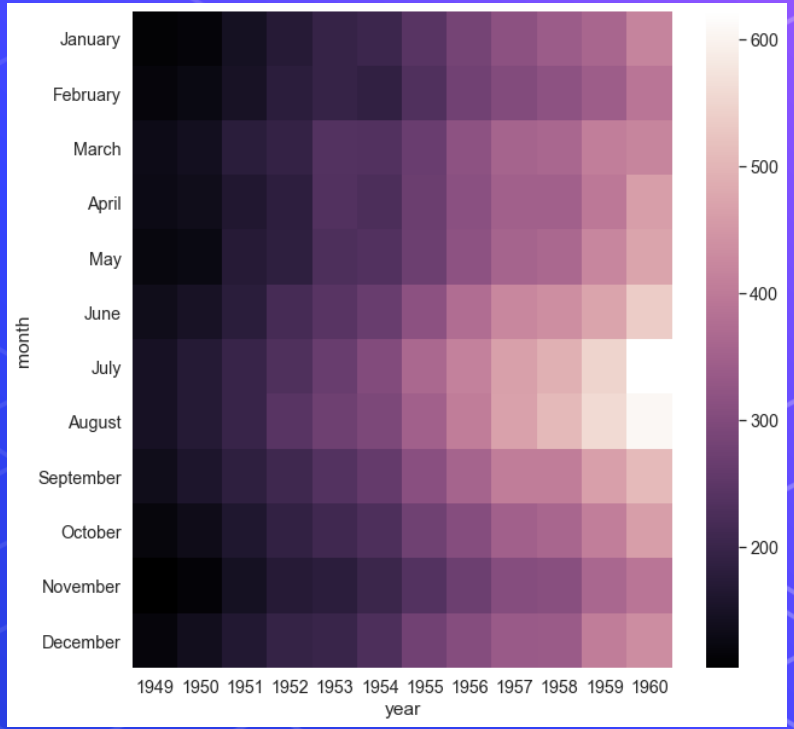
Matrix Plots

heatmap




```
1 sns.heatmap(flights)
```

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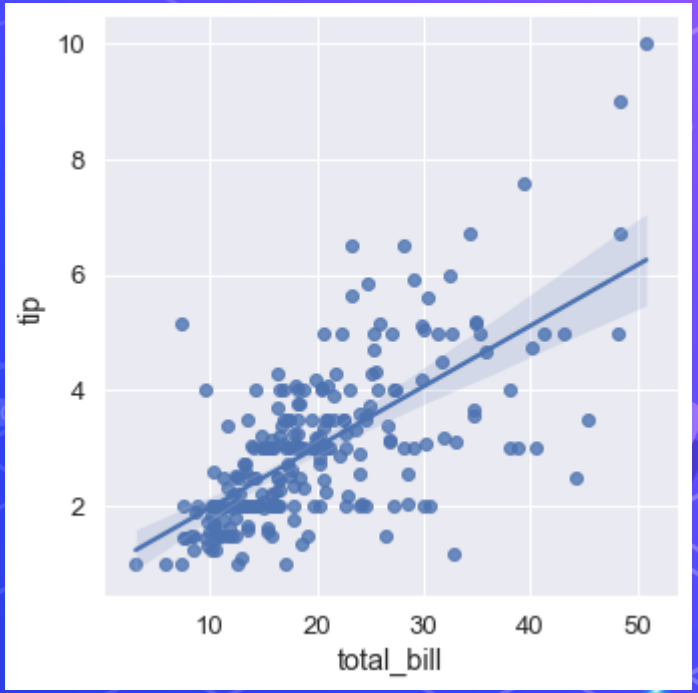
Regression Plots

lmplot




```
1 sns.lmplot(x='total_bill', y='tip', data=tips)
```

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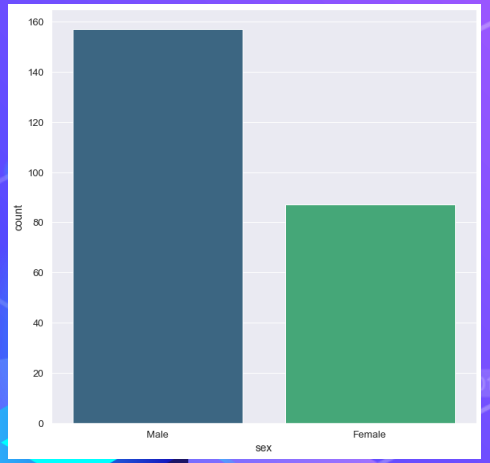
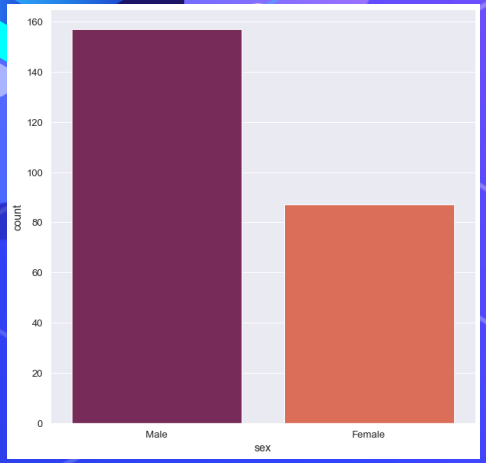
Color palettes

- Set1
- Set2
- Set3
- rocket
- cubehelix
- viridis
- ...

```
1 sns.countplot(x='sex', data=tips, palette='viridis')
```




```
1 sns.countplot(x='sex', data=tips, palette='rocket')
```



You can check all possible values for different color palettes from here

https://seaborn.pydata.org/tutorial/color_palettes.html

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Change Plot Size

- Change size with `sns.set()`
- Change size with `aspect` and `height`
- Change Font Scale

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Questions ?!

Thanks!

>_ Live long and prosper