Week 4

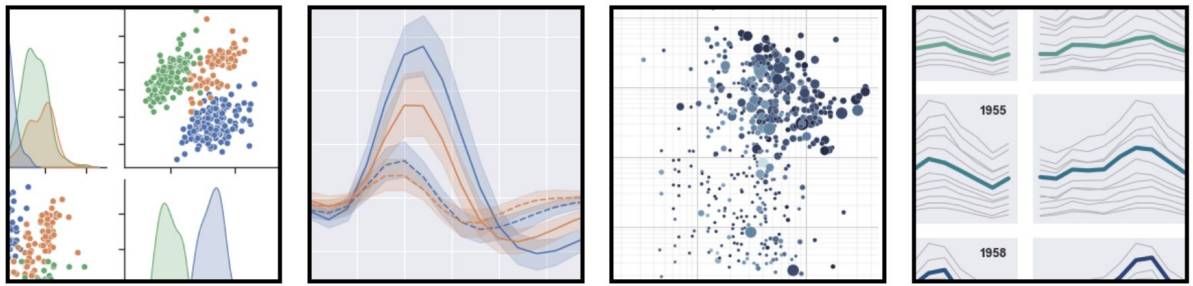
COGS 108 Sp 2025

Due dates

- Q3: Monday (04/21)
- Project Review: Wednesday (04/23)
- D3: Friday (04/25)

Pyplot and seaborn

Seaborn is a Python data visualization library based on matplotlib. It provides a high-level interface for drawing attractive and informative statistical graphics. Alias : sns



Pandas Series and Dataframes

Python3

```python
#importing pandas library
import pandas as pd

#Creating a list
author = ['Jitender', 'Purnima', 'Arpit', 'Jyoti']
#Creating a Series by passing list variable to Series() function
auth_series = pd.Series(author)
#Printing Series
print(auth_series)
```

Output:

```
0    Jitender
1     Purnima
2       Arpit
3       Jyoti
dtype: object
```

Pandas Series and Dataframes

We have created two lists ‘author’ and article’ which have been passed to Series() functions to create two Series.

After creating Series, we have created a dictionary and passed Series objects as values of the dictionary and keys of the dictionary will be served as Columns of the dataframe.

Python3

```
#Importing Pandas library
import pandas as pd

#Creating two lists
author = ['Jitender', 'Purnima', 'Arpit', 'Jyoti']
article = [210, 211, 114, 178]
#Creating two Series by passing lists
auth_series = pd.Series(author)
article_series = pd.Series(article)
#Creating a dictionary by passing Series objects as values
frame = { 'Author': auth_series, 'Article': article_series }
#Creating DataFrame by passing Dictionary
result = pd.DataFrame(frame)
#Printing elements of Dataframe
print(result)
```

Output:

```
     Author  Article
0  Jitender      210
1   Purnima      211
2     Arpit      114
3     Jyoti      178
```

Part I : Cheating

```
feature_counts =
dataFrame['feature'].value_counts()
```

`df['your_column'].value_counts()` - this will return the count of unique occurences in the specified column.

It is important to note that `value_counts` only works on pandas series, not Pandas dataframes. As a result, we only include one bracket df['your_column'] and not two brackets df[['your_column']].

Parameters

- **normalize (bool, default False) -** If True then the object returned will contain the relative frequencies of the unique values.
- **sort (bool, default True) -** Sort by frequencies.
- **ascending (bool, default False) -** Sort in ascending order.
- **bins (int, optional) -** Rather than count values, group them into half-open bins, a convenience for `pd.cut`, only works with numeric data.
- **dropna (bool, default True) -**Don't include counts of NaN.

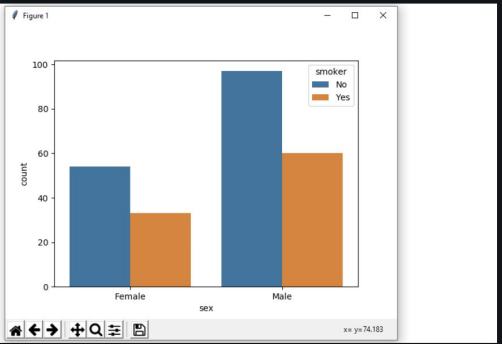
Part I : Cheating

sns.countplot(x, y, hue, data=df);

Python3

```
# importing the required library

import seaborn as sns
import matplotlib.pyplot as plt

# read a tips.csv file from seaborn library
df = sns.load_dataset('tips')

# count plot on two categorical variable
sns.countplot(x ='sex', hue = "smoker", data = df)

# Show the plot
plt.show()
```

Output :



Part I : Cheating

create a DataFrame prop_df with three columns, one for gender, one for cheated, and one including the proportion of respondents who cheated within each gender

```
prop_df = (survey['cheated']
        .groupby(...)
        .value_counts(normalize=True)
        .rename(...)
        .reset_index())
```

Part I : Cheating

Regenerate your barplot using the proportion data you just generated to determine which gender cheats more frequently.

Assign your seaborn plot to a variable named plot_proportion

```
plot_proportion = sns.barplot(x=' ',
        y=' ',
        hue=' ',
        data=dataFrame);
```

Y axis is cheated
Y axis is proportion
The hue is the gender

Swapping: include
hue_order=["Male","Female"],