Lab: Creating Visualizations with matplotlib

0. On Your Own: Ask your favorite AI "Write Python code that checks if the SciPy, statsmodels, matplotlib packages are installed". Run the code and give the report here. If the code does not function as expected, fix it.

1. Install matplotlib and create a first simple visualization. Use this line in your code to import matplotlib:

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

   a. Define a list of x values and y values. The lists should be the same length.
   b. Plot these values as a line graph.
   c. Plot these values as a scatter plot.
   d. Add a second set of X and Y values and add these to the plot as a line graph.
   e. Add a title and axis labels.

2. Create a histogram from the trip miles data found in the file "Trips from area 8.json".
   a. Use trip miles as the X axis and frequency as the Y axis.

3. Create a second histogram from the trip miles data found in the file "Trips from area 8.json".
   a. Use payment method as the X axis and (sum of) tips as the Y axis.
   b. Drop rows with NA values.
   c. Assign appropriate labels and a title to the plot

4. Create a scatter plot of fares and tips from the file "Trips_Fri07072017T4 trip_miles gt1.json".
   a. Put the fare on the X axis and tips on the Y axis.
   b. What conclusions can you draw about the data from this scatter plot?

5. Create a scatter plot of fares by trip miles based on "Trips from area 8.json".
   a. Put the fare on the X axis and the trip miles on the Y axis. Use plt.scatter().
   b. Now create the same scatter plot using plt.plot with linestyle= "none" and marker="."
   c. Now make the plot fancier, with a "v" marker, cyan color, and 0.2 transparency.
   d. What conclusions can you draw about this data?

6. Create a scatter plot of fares by trip miles based on "Trips from area 8.json".
    a. Save the plot to a file called FaresXmiles.png
    b. Filter out trips of 0 miles.
    c. Filter out trips less than 2 miles.
    d. What anomalies do you notice in the data?

7. Create a 3D plot of fares, trip miles and dropoff area based on "Trips from area 8.json". To do this you will need to add this line to your code:

```
from mpl_toolkits.mplot3d import Axes3D
```

On Your Own: Create a headmap from pickup_community_area and dropoff_community_area based on "taxi trips Fri 7_7_2017.csv". To do this you will need to install seaborn and add this line to your code:

```
import seaborn as sns
```