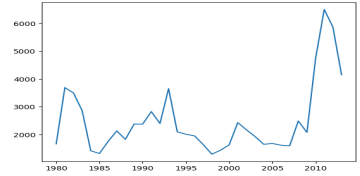
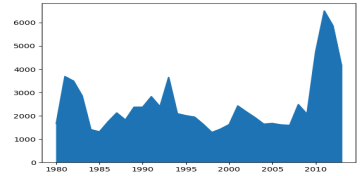
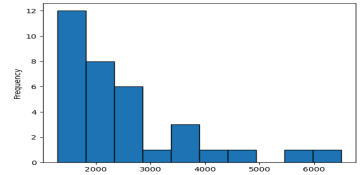
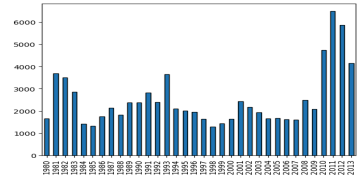




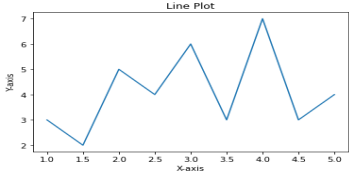
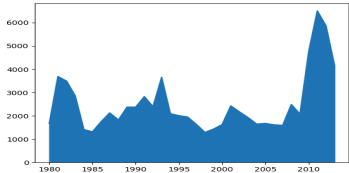
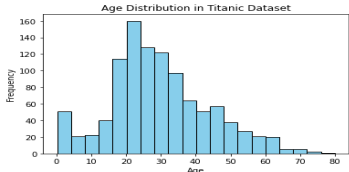
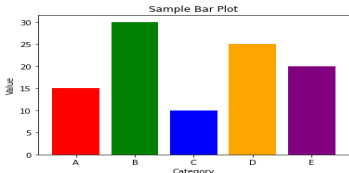
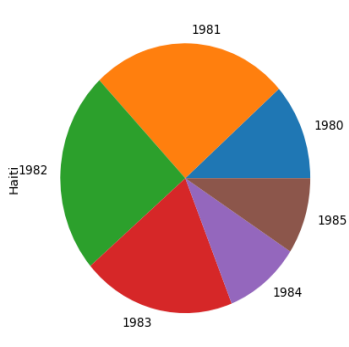
## Data Visualization with Python

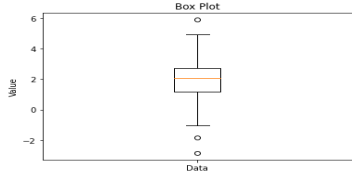
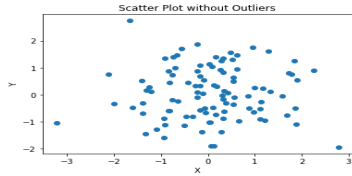
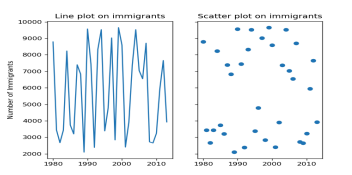
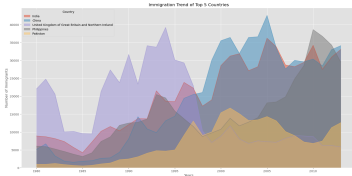
### Cheat Sheet : Plotting with Matplotlib using Pandas

Plot Type	Description	Pandas Function	Example	Visual
Line Plot	Shows trends and changes over time	<code>DataFrame.plot.line()</code> <code>DataFrame.plot(kind = 'line')</code>	<code>df.plot(x='year', y='sales', kind='line')</code>	
Area Plot	Displays data series as filled areas, showing the relationship between them	<code>DataFrame.plot.area()</code> <code>DataFrame.plot(kind = 'area')</code>	<code>df.plot(kind='area')</code>	
Histogram	Displays bars representing the data count in each interval/bin	<code>Series.plot.hist()</code> <code>Series.plot(kind = 'hist', bins = n)</code>	<code>s.plot(kind='hist', bins=10)</code> <code>df['age'].plot(kind='hist', bins=10)</code>	
Bar Chart	Displays data using rectangular bars	<code>DataFrame.plot.bar()</code> <code>DataFrame.plot(kind = 'bar')</code>	<code>df.plot(kind='bar')</code>	

Plot Type	Description	Pandas Function	Example	Visual
Pie Chart	Displays data as a circular plot divided into slices, representing proportions or percentages of a whole	<pre>Series.plot.pie() Series.plot(kind = 'pie') DataFrame.plot.pie(y, labels) DataFrame.plot(kind = 'pie')</pre>	<pre>s.plot(kind='pie', autopct='%1.1f%%') df.plot(x='Category', y='Percentage', kind='pie')</pre>	
Box Plot	Displays the distribution of a dataset along with key statistical measures	<pre>DataFrame.plot.box() DataFrame.plot(kind = 'box')</pre>	<pre>df_can.plot(kind='box')</pre>	
Scatter Plot	Uses Cartesian coordinates to display values for two variables	<pre>DataFrame.plot.scatter() DataFrame.plot(x, y, kind = 'scatter')</pre>	<pre>df.plot(x='Height', y='Weight', kind='scatter')</pre>	

## Cheat Sheet : Plotting directly with Matplotlib

Plot Type	Description	Matplotlib Function	Example	Visual
Line Plot	Shows trends and changes over time	<code>plt.plot()</code>	<code>plt.plot(x, y, color='red', linewidth=2)</code>	 <p>A line plot titled "Line Plot" showing a fluctuating trend over time. The x-axis is labeled "X-axis" and ranges from 1.0 to 5.0. The y-axis is labeled "Y-axis" and ranges from 2 to 7. The plot shows a blue line with a linewidth of 2, starting at (1.0, 3.0), dipping to (1.5, 2.0), rising to (2.0, 5.0), dipping to (2.5, 4.0), rising to (3.0, 6.0), dipping to (3.5, 3.0), rising to (4.0, 7.0), dipping to (4.5, 3.0), and ending at (5.0, 4.0).</p>
Area Plot	Display data series as filled areas	<code>plt.fill_between()</code>	<code>plt.fill_between(x, y1, y2, color='blue', alpha=0.5)</code>	 <p>An area plot showing a data series as a filled blue area. The x-axis represents years from 1980 to 2010, and the y-axis represents values from 0 to 6000. The area is filled with a semi-transparent blue color (alpha=0.5). The plot shows a fluctuating trend with a significant peak around 2010.</p>
Histogram	Displays bars representing the data count in each interval/bin	<code>plt.hist()</code>	<code>plt.hist(data, bins=10, color='orange', edgecolor='black')</code>	 <p>A histogram titled "Age Distribution in Titanic Dataset" showing the frequency distribution of data. The x-axis is labeled "Age" and ranges from 0 to 80. The y-axis is labeled "Frequency" and ranges from 0 to 160. The bars are orange with black edges. The distribution is roughly bell-shaped, peaking around age 20-30.</p>
Bar Chart	Displays data using rectangular bars	<code>plt.bar()</code>	<code>plt.bar(x, height, color='green', width=0.5)</code>	 <p>A bar chart titled "Sample Bar Plot" showing data for categories A, B, C, D, and E. The x-axis is labeled "Category" and the y-axis is labeled "Value" and ranges from 0 to 30. The bars are colored red, green, blue, orange, and purple respectively. The heights of the bars are approximately 15, 30, 10, 25, and 20.</p>
Pie Chart	Displays data as a circular plot divided into slices, representing proportions or percentages of a whole	<code>plt.pie()</code>	<code>plt.pie(sizes, labels=labels, colors=colors, explode=explode)</code>	 <p>A pie chart showing proportions of data for years 1981, 1980, 1985, 1984, and 1983. The slices are colored orange, blue, brown, purple, and red respectively. The labels are placed around the chart. The slices represent different proportions of the whole.</p>

Plot Type	Description	Matplotlib Function	Example	Visual
Box Plot	Displays the distribution of a dataset along with key statistical measures	<code>plt.boxplot()</code>	<code>plt.boxplot(data, notch=True)</code>	
Scatter Plot	Uses Cartesian coordinates to display values for two variables	<code>plt.scatter()</code>	<code>plt.scatter(x, y, color='purple', marker='o', s=50)</code>	
Subplotting	Creating multiple plots on one figure	<code>plt.subplots()</code>	<code>fig, axes = plt.subplots(nrows=2, ncols=2)</code>	
Customization	Customizing plot: adding labels, title, legend, grid	Various customization	<code>plt.title('Title')</code> <code>plt.xlabel('X Label')</code> <code>plt.ylabel('Y Label')</code> <code>plt.legend()</code> <code>plt.grid(True)</code>	

Author(s)

Dr. Pooja