Visualization

Seaborn & Matplotlib Library

for beginner

Qusay AL-Btoush

github.com/qusaybtoush
https://www.linkedin.com/in/qusayal-btoush
https://www.kaggle.com/qusaybtoush1990

Matplotlib and Seaborn

For Beginner

- Data visualization is a powerful tool for understanding and presenting data. There are various libraries in Python that are commonly used for data visualization. Here are some examples using Matplotlib and Seaborn:

concat me if you have any questions : Qusay AL-Btoush

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In [26]:
```
# import the library Matplotlib and seaborn

import matplotlib.pyplot as plt  #import Matplotlib
import seaborn as sns     # import seaborn
```

Type of visualisation:

- Distribution > Histogram
- Correlation > Scatter plot
- Ranking > Bar chart
- Classification > Heatmap
- Time > Line chart

You can upload data set and start build visualization

Matplotlib

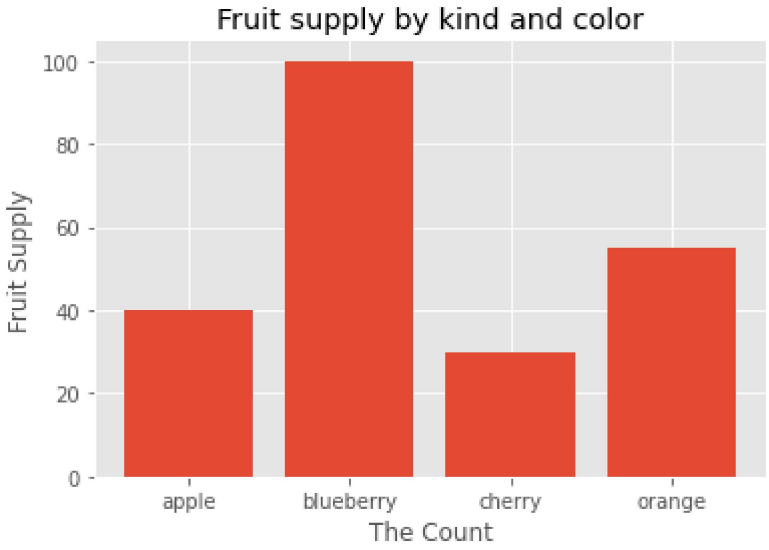
Matplotlib is a comprehensive data visualization library in Python. It allows you to create a wide range of static, animated, and interactive plots and charts. Matplotlib is highly customizable and offers a variety of plotting options for various data types and formats.

Here's a basic example of creating a simple line plot using Matplotlib

In [8]:
```
# You can choose the style for visualization

plt.style.use('ggplot') # this style ggplot, there many style you can choose https://ma
```

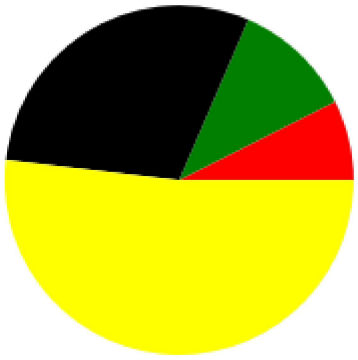
In [32]:
```
# bar chart

fruits = ['apple', 'blueberry', 'cherry', 'orange']
counts = [40, 100, 30, 55]

plt.bar(fruits, counts)
```

```
plt.ylabel('Fruit Supply')  # the name y label
plt.xlabel("The Count")      # the name x label
plt.title('Fruit supply by kind and color')  # the Title graph
plt.show()
```



In [33]:

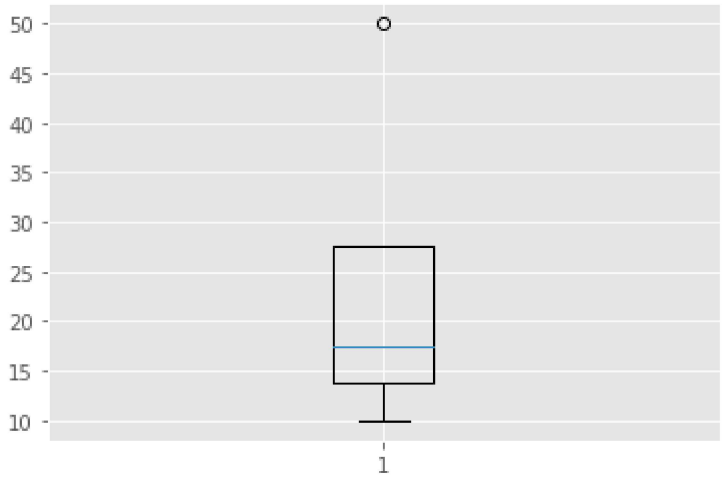
```
# pie chart

x = [10, 15, 40, 70 ]
colors = ["Red","Green","Black","Yellow"]  # I can choose the color depend on the categ
# plot
plt.pie(x, colors=colors )

plt.show()
```



In [49]:

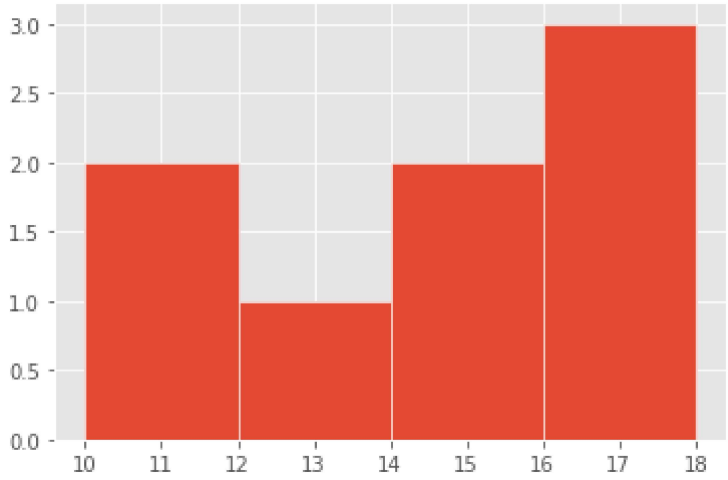
```
#box plot  you using this graph to show the outlier value

A=[10,15,20,50]

plt.boxplot(A)
plt.show
```

Out[49]: <function matplotlib.pyplot.show(close=None, block=None)>



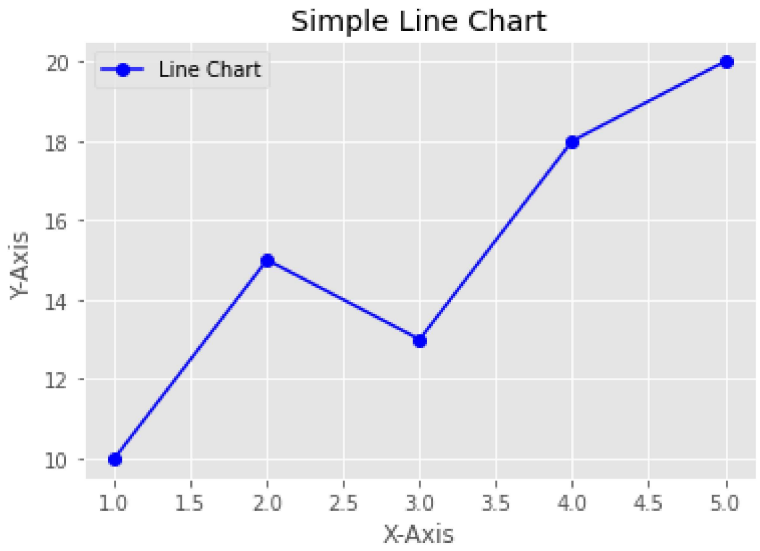
In [59]:

```
# Histogram
h=[10,11,12,14,15,16,17,18]
plt.hist(h,bins=4, linewidth=0.5, edgecolor="white")
plt.show()
```



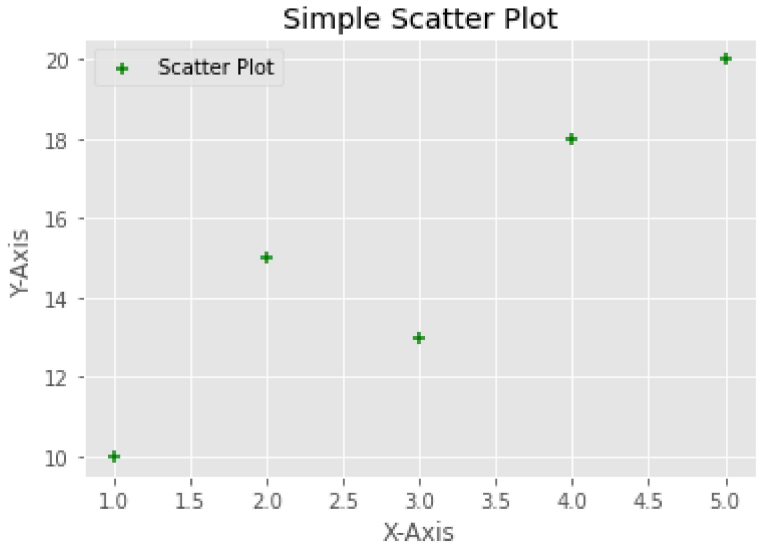
In [61]:

```
#Line chart

x = [1, 2, 3, 4, 5]
y = [10, 15, 13, 18, 20]

# Create a line chart
plt.plot(x, y, label='Line Chart', marker='o', linestyle='-', color='b')

# Add labels and a title
plt.xlabel('X-Axis')
plt.ylabel('Y-Axis')
plt.title('Simple Line Chart')

# Add a legend
plt.legend()

# Show the plot
plt.grid(True)  # Add grid lines
plt.show()
```



In [64]:

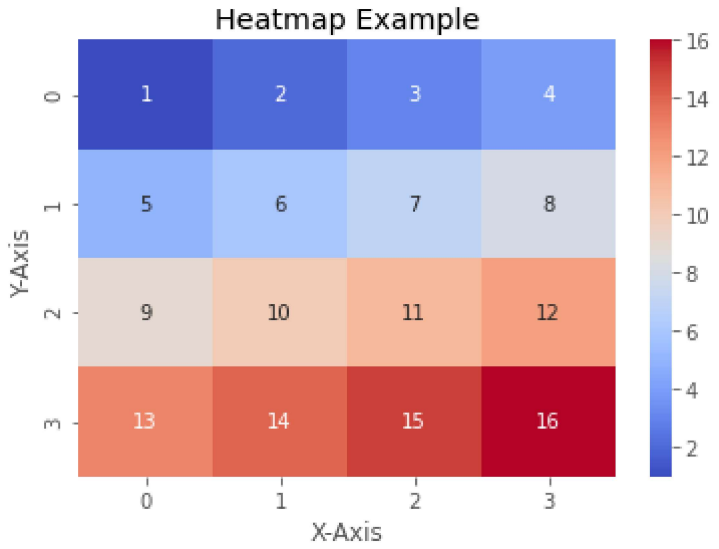
```
# scatter plot
# Sample data
x = [1, 2, 3, 4, 5]
y = [10, 15, 13, 18, 20]

# Create a scatter plot
plt.scatter(x, y, label='Scatter Plot', color='g', marker='+')

# Add labels and a title
plt.xlabel('X-Axis')
plt.ylabel('Y-Axis')
plt.title('Simple Scatter Plot')

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



In [65]:

```
#heat Map

# Sample data (as a 2D matrix)
data = [
```

```
    [1, 2, 3, 4],
    [5, 6, 7, 8],
    [9, 10, 11, 12],
    [13, 14, 15, 16]
]

# Create a heatmap
sns.heatmap(data, annot=True, cmap='coolwarm')

# Add labels and a title
plt.xlabel('X-Axis')
plt.ylabel('Y-Axis')
plt.title('Heatmap Example')

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



This visuals simple in matplotlib, you can do a lot of visualisations when you work in the data set

---

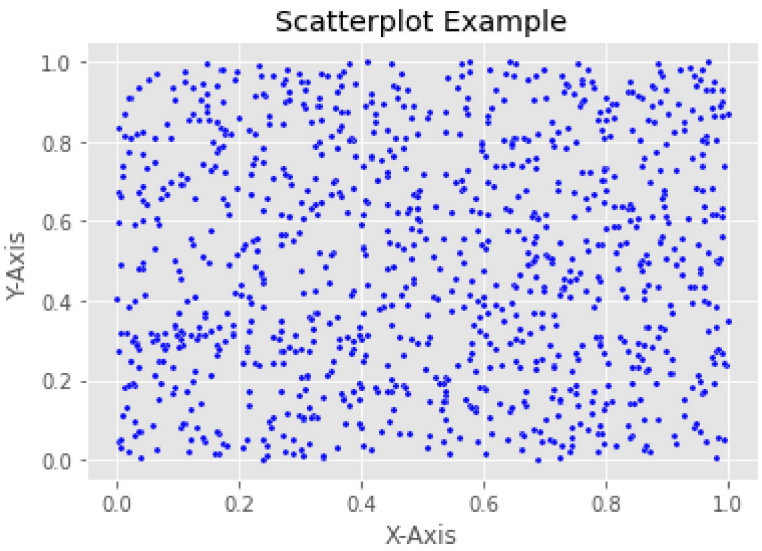
Seaborn

Seaborn is a Python data visualization library that's built on top of Matplotlib and provides a high-level interface for creating informative and attractive statistical graphics. Seaborn is particularly well-suited for visualizing complex datasets and for creating statistical plots with ease. Here's an overview of Seaborn

In [68]:

```
# scatter plot using seaborn

import numpy as np  # numpy for create random values

# Generate random data with a large number of points
num_points = 1000
x = np.random.rand(num_points)
```

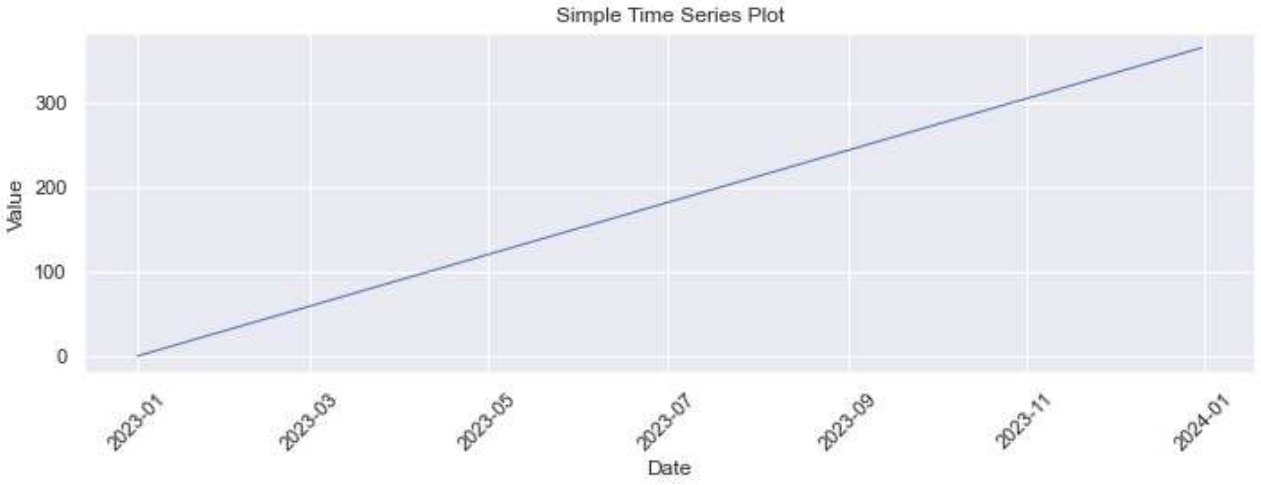
```
y = np.random.rand(num_points)

# Create a scatterplot
sns.scatterplot(x= x, y= y, marker='o', color='b', s=10)  # s controls the marker size

# Add labels and a title
plt.xlabel('X-Axis')
plt.ylabel('Y-Axis')
plt.title('Scatterplot Example')

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



In [71]:

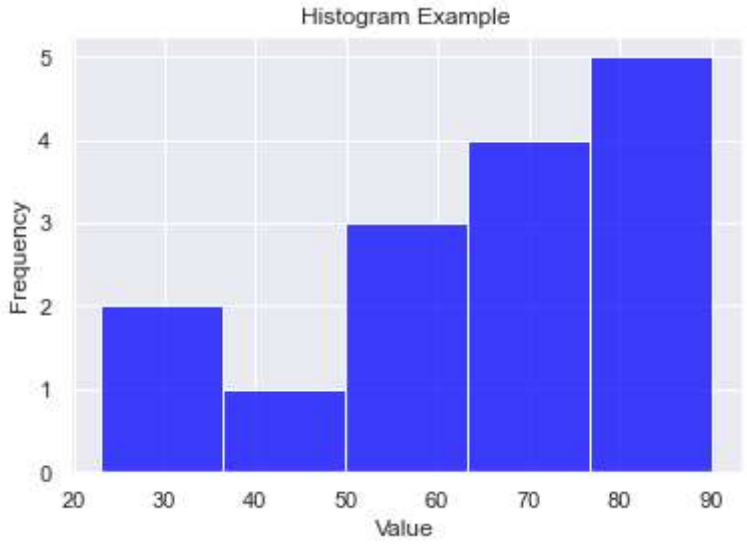
```
# Line chart with time

# Create a time series with a linear trend
start_date = '2023-01-01'
end_date = '2023-12-31'
date_range = pd.date_range(start=start_date, end=end_date)
values = range(len(date_range))

# Create a DataFrame
data = {'Date': date_range, 'Value': values}
df = pd.DataFrame(data)

# Create a time series plot
sns.set(style='darkgrid')
plt.figure(figsize=(10, 4))

sns.lineplot(x='Date', y='Value', data=df, linewidth=1)

# Add labels and a title
plt.xlabel('Date')
plt.ylabel('Value')
plt.title('Simple Time Series Plot')

# Rotate x-axis labels for better readability
plt.xticks(rotation=45)

# Show the plot
```

```
plt.tight_layout()
plt.show()
```



In [73]:

```
# Histogram

# Sample data
data = [23, 35, 45, 50, 53, 60, 65, 68, 70, 75, 78, 80, 82, 85, 90]

# Create a histogram
sns.histplot(data,  color='blue', bins=5)

# Add labels and a title
plt.xlabel('Value')
plt.ylabel('Frequency')
plt.title('Histogram Example')

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

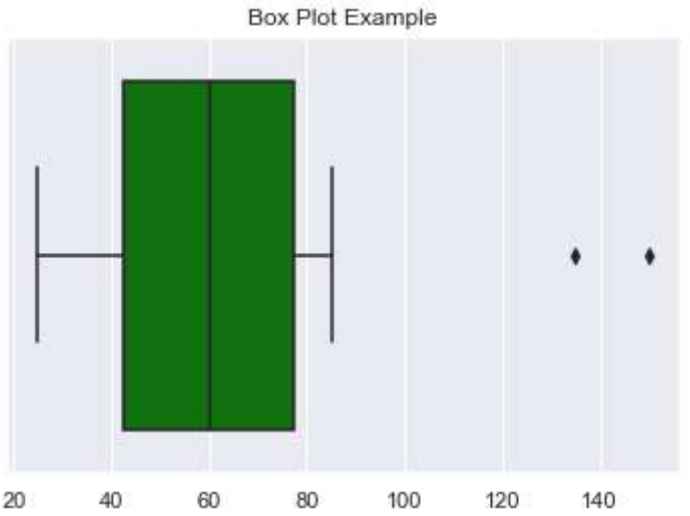


In [76]:

```
# box plot

# Sample data
data = [25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 150, 135]
```

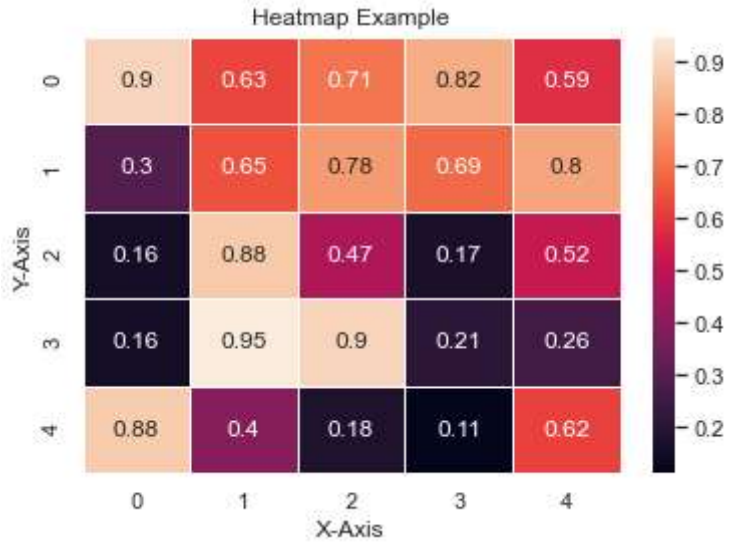
```
# Create a box plot
sns.boxplot(data, color='green')

# Add a title
plt.title('Box Plot Example')

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

```
C:\Users\QUSAI\anaconda3\envs\pythonProject1\lib\site-packages\seaborn\_decorators.py:36: FutureWarning: Pass the following variable as a keyword arg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```



In [78]:

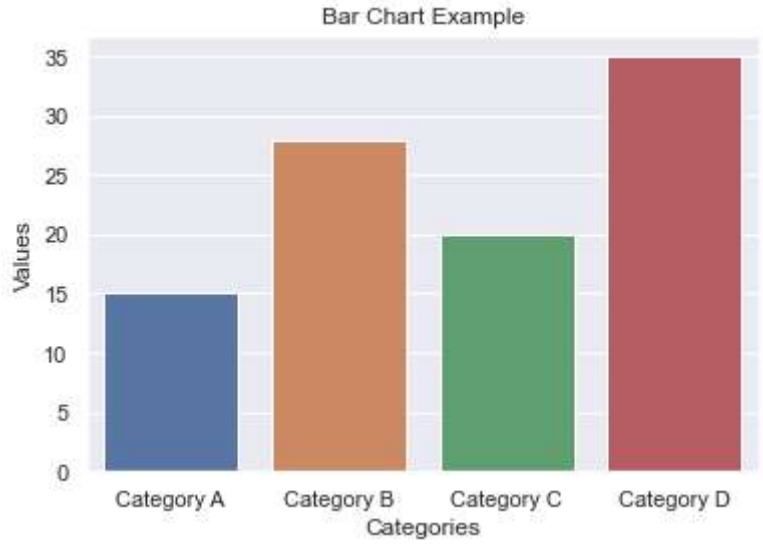
```
# heat map

# Create a sample 2D data matrix
data = np.random.rand(5, 5)

# Create a heatmap
sns.heatmap(data, annot=True, linewidths=.5)

# Add labels and a title
plt.xlabel('X-Axis')
plt.ylabel('Y-Axis')
plt.title('Heatmap Example')

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



In [82]:

```
# bar chart seaborn


# Sample data
categories = ['Category A', 'Category B', 'Category C', 'Category D']
values = [15, 28, 20, 35]

# Create a bar chart
sns.barplot(x=categories, y=values)

# Add labels and a title
plt.xlabel('Categories')
plt.ylabel('Values')
plt.title('Bar Chart Example')

# Show the bar chart
plt.show
```

Out[82]: <function matplotlib.pyplot.show(close=None, block=None)>



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