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 Batch-F3

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from pandas import Series, DataFrame
```

```
# Reading the tips.csv file
df1=pd.read_csv('/content/drive/MyDrive/Colab Notebooks/tips.csv')
```

```
df1.head()
```

| | total_bill | tip | sex | smoker | day | time | size |
|---|------------|------|--------|--------|-----|--------|------|
| 0 | 16.99 | 1.01 | Female | No | Sun | Dinner | 2 |
| 1 | 10.34 | 1.66 | Male | No | Sun | Dinner | 3 |
| 2 | 21.01 | 3.50 | Male | No | Sun | Dinner | 3 |
| 3 | 23.68 | 3.31 | Male | No | Sun | Dinner | 2 |
| 4 | 24.59 | 3.61 | Female | No | Sun | Dinner | 4 |

```
from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

```
df1.tail()
```

| | total_bill | tip | sex | smoker | day | time | size |
|-----|------------|------|--------|--------|------|--------|------|
| 239 | 29.03 | 5.92 | Male | No | Sat | Dinner | 3 |
| 240 | 27.18 | 2.00 | Female | Yes | Sat | Dinner | 2 |
| 241 | 22.67 | 2.00 | Male | Yes | Sat | Dinner | 2 |
| 242 | 17.82 | 1.75 | Male | No | Sat | Dinner | 2 |
| 243 | 18.78 | 3.00 | Female | No | Thur | Dinner | 2 |

```
df1.columns
```

```
Index(['total_bill', 'tip', 'sex', 'smoker', 'day', 'time', 'size'], dtype='object')
```

```
df1.info()
```

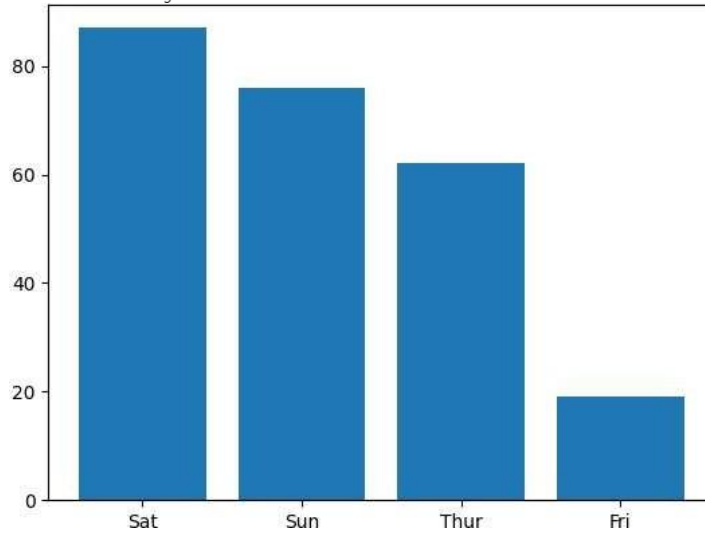
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 244 entries, 0 to 243
Data columns (total 7 columns):
#   Column      Non-Null Count  Dtype
---  -
0   total_bill  244 non-null    float64
1   tip         244 non-null    float64
2   sex        244 non-null    object
3   smoker     244 non-null    object
4   day        244 non-null    object
5   time       244 non-null    object
6   size       244 non-null    int64
dtypes: float64(2), int64(1), object(4)
memory usage: 13.5+ KB
```

```
df1.describe()
```

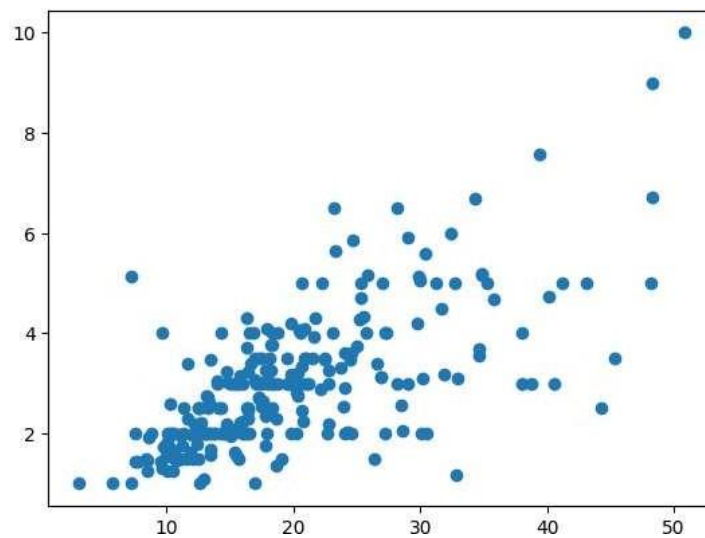
| | total_bill | tip | size |
|-------|------------|------------|------------|
| count | 244.000000 | 244.000000 | 244.000000 |
| mean | 19.785943 | 2.998279 | 2.569672 |
| std | 8.902412 | 1.383638 | 0.951100 |
| min | 3.070000 | 1.000000 | 1.000000 |
| 25% | 13.347500 | 2.000000 | 2.000000 |

```
a=pd.DataFrame(df1['day'].value_counts())
a.reset_index(inplace=True)
plt.bar(a['index'],a['day'])
```

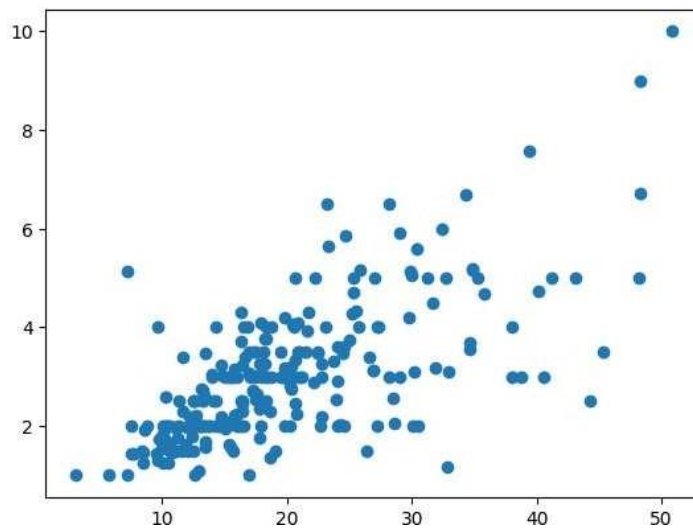
<BarContainer object of 4 artists>



```
plt.scatter(df1['total_bill'],df1['tip'])
plt.show()
```



```
plt.scatter(x='total_bill',y='tip',data=df1)
fig=plt.figure(figsize=(5,4))
ax=fig.add_axes([1,1,1,1])
ax.legend(labels=('sun','mon','tue'))
plt.show()
```



```
#Different types of Matplotlib Plots
#bar chart
import matplotlib.pyplot as plt
import pandas as pd

# Reading the tips.csv file
data = pd.read_csv('/content/sample_data/tips.csv')

# initializing the data
x = data['day']
y = data['total_bill']

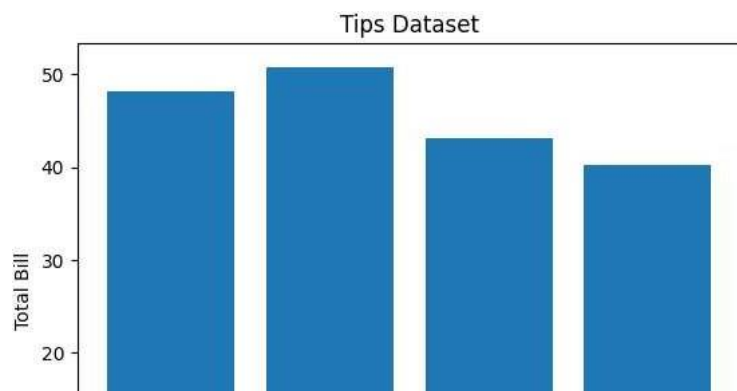
# plotting the data
plt.bar(x, y)

# Adding title to the plot
plt.title("Tips Dataset")

# Adding label on the y-axis
plt.ylabel('Total Bill')

# Adding label on the x-axis
plt.xlabel('Day')

plt.show()
```



Customization that is available for the Bar Chart –

color: For the bar faces

edgecolor: Color of edges of the bar

linewidth: Width of the bar edges

width: Width of the bar

```
import matplotlib.pyplot as plt
import pandas as pd
```

```
# initializing the data
```

```
x = data['day']
```

```
y = data['total_bill']
```

```
# plotting the data
```

```
plt.bar(x, y, color='green', edgecolor='blue',
        linewidth=2)
```

```
# Adding title to the plot
```

```
plt.title("Tips Dataset")
```

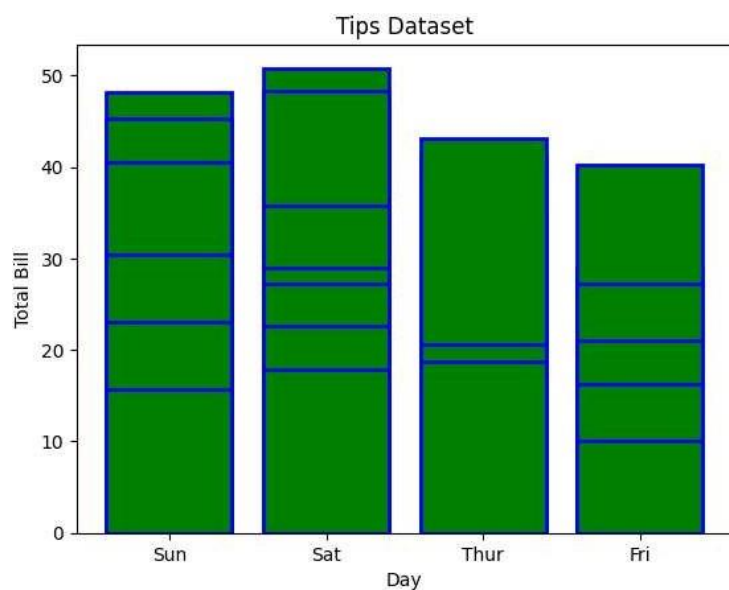
```
# Adding label on the y-axis
```

```
plt.ylabel('Total Bill')
```

```
# Adding label on the x-axis
```

```
plt.xlabel('Day')
```

```
plt.show()
```



Histogram A histogram is basically used to represent data provided in a form of some groups. It is a type of bar plot where the X-axis represents the bin ranges while the Y-axis gives information about frequency. The hist() function is used to compute and create histogram of x.

```
import matplotlib.pyplot as plt
import pandas as pd
```

```
# initializing the data
x = data['total_bill']

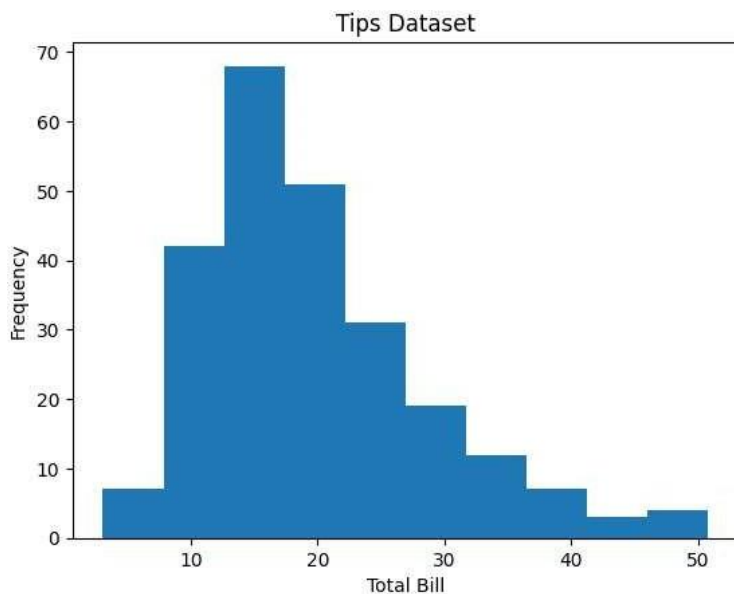
# plotting the data
plt.hist(x)

# Adding title to the plot
plt.title("Tips Dataset")

# Adding label on the y-axis
plt.ylabel('Frequency')

# Adding label on the x-axis
plt.xlabel('Total Bill')

plt.show()
```



Customization that is available for the Histogram –

bins: Number of equal-width bins color: For changing the face color edgecolor: Color of the edges linestyle: For the edgelines alpha: blending value, between 0 (transparent) and 1 (opaque)

```
import matplotlib.pyplot as plt
import pandas as pd
```

```
# initializing the data
x = data['total_bill']

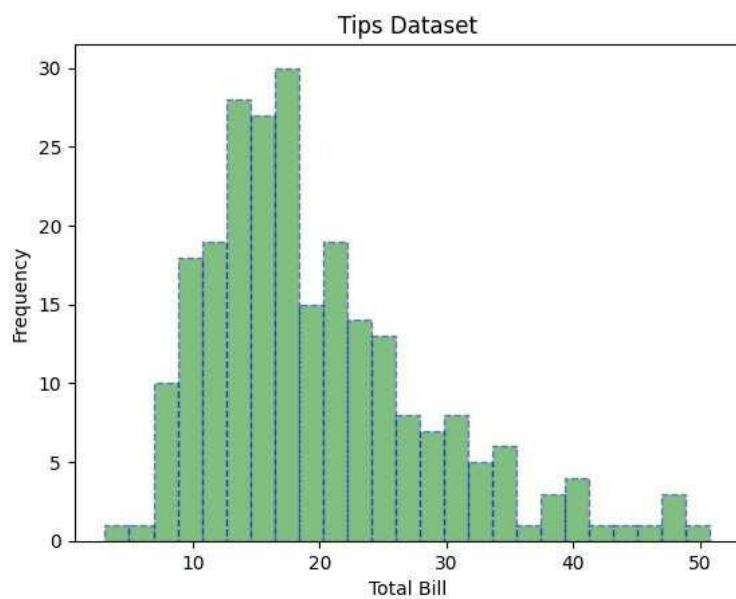
# plotting the data
plt.hist(x, bins=25, color='green', edgecolor='blue',
        linestyle='--', alpha=0.5)

# Adding title to the plot
plt.title("Tips Dataset")

# Adding label on the y-axis
plt.ylabel('Frequency')
```

```
# Adding label on the x-axis
plt.xlabel('Total Bill')

plt.show()
```



Scatter Plot Scatter plots are used to observe relationships between variables. The `scatter()` method in the `matplotlib` library is used to draw a scatter plot.

```
import matplotlib.pyplot as plt
import pandas as pd
```

```
# initializing the data
x = data['day']
y = data['total_bill']
```

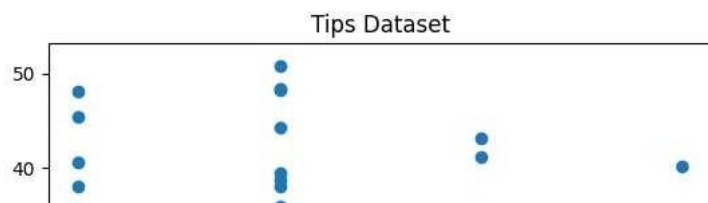
```
# plotting the data
plt.scatter(x, y)
```

```
# Adding title to the plot
plt.title("Tips Dataset")
```

```
# Adding label on the y-axis
plt.ylabel('Total Bill')
```

```
# Adding label on the x-axis
plt.xlabel('Day')
```

```
plt.show()
```



Customizations that are available for the scatter plot are –

s: marker size (can be scalar or array of size equal to size of x or y)

c: color of sequence of colors for markers

marker: marker style

linewidths: width of marker border

edgecolor: marker border color

alpha: blending value, between 0 (transparent) and 1 (opaque)

```
import matplotlib.pyplot as plt
import pandas as pd
```

```
# initializing the data
```

```
x = data['day']
```

```
y = data['total_bill']
```

```
# plotting the data
```

```
plt.scatter(x, y, c=data['size'], s=data['total_bill'],
            marker='D', alpha=0.5)
```

```
# Adding title to the plot
```

```
plt.title("Tips Dataset")
```

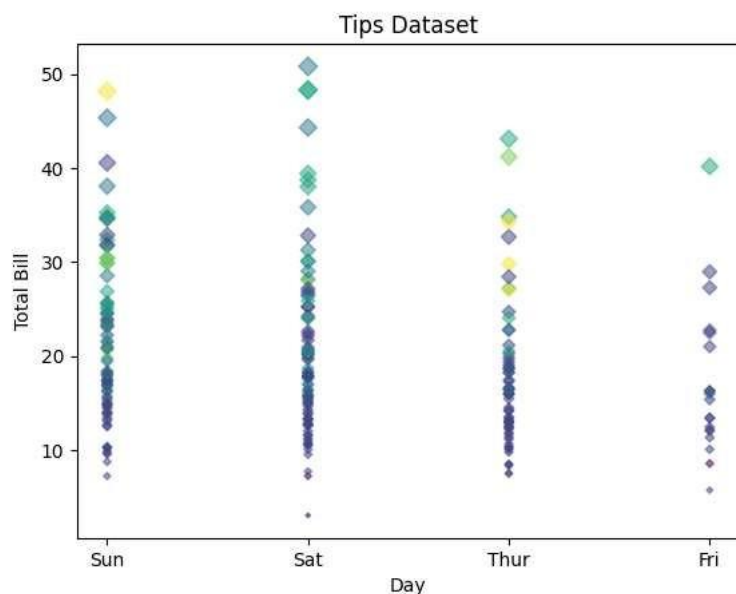
```
# Adding label on the y-axis
```

```
plt.ylabel('Total Bill')
```

```
# Adding label on the x-axis
```

```
plt.xlabel('Day')
```

```
plt.show()
```



Pie Chart Pie chart is a circular chart used to display only one series of data. The area of slices of the pie represents the percentage of the parts of the data. The slices of pie are called wedges. It can be created using the `pie()` method.

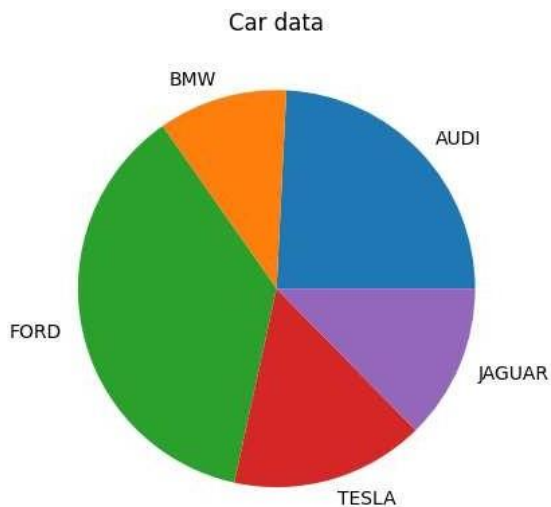
```
import matplotlib.pyplot as plt
import pandas as pd
```

```
# initializing the data
cars = ['AUDI', 'BMW', 'FORD',
        'TESLA', 'JAGUAR',]
data = [23, 10, 35, 15, 12]
```

```
# plotting the data
plt.pie(data, labels=cars)
```

```
# Adding title to the plot
plt.title("Car data")
```

```
plt.show()
```



Customizations that are available for the Pie chart are –

explode: Moving the wedges of the plot autopct: Label the wedge with their numerical value. color: Attribute is used to provide color to the wedges. shadow: Used to create shadow of wedge.

```
import matplotlib.pyplot as plt
import pandas as pd
```

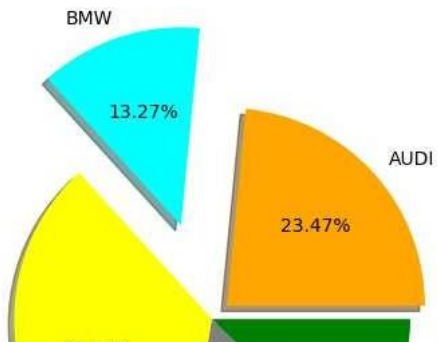
```
# initializing the data
cars = ['AUDI', 'BMW', 'FORD',
        'TESLA', 'JAGUAR',]
data = [23, 13, 35, 15, 12]
```

```
explode = [0.1, 0.5, 0, 0, 0]
```

```
colors = ( "orange", "cyan", "yellow",
           "grey", "green",)
```

```
# plotting the data
plt.pie(data, labels=cars, explode=explode, autopct='%1.2f%%',
        colors=colors, shadow=True)
```

```
plt.show()
```

▼ Saving a Plot

For saving a plot in a file on storage disk, `savefig()` method is used. A file can be saved in many formats like .png, .jpg, .pdf, etc.

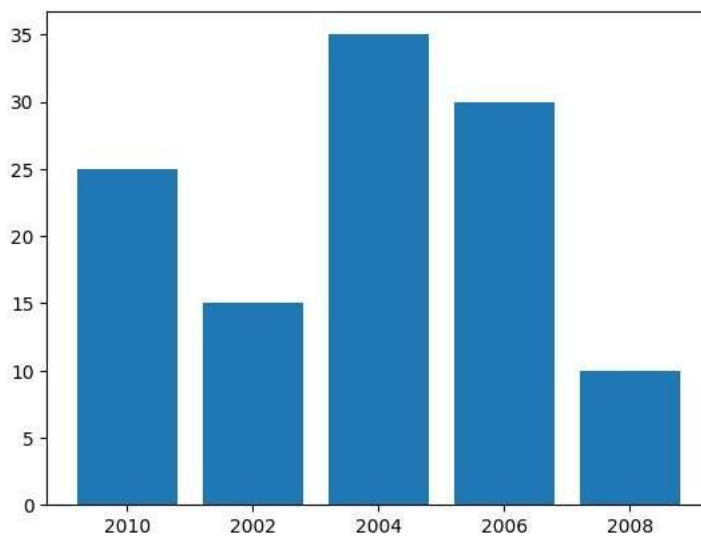
```
import matplotlib.pyplot as plt

# Creating data
year = ['2010', '2002', '2004', '2006', '2008']
production = [25, 15, 35, 30, 10]

# Plotting barchart
plt.bar(year, production)

# Saving the figure.
plt.savefig("output.jpg")

# Saving figure by changing parameter values
plt.savefig("output1", facecolor='y', bbox_inches="tight",
            pad_inches=0.3, transparent=True)
```



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