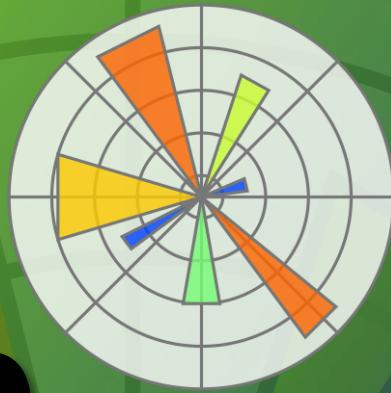


Data Visualization using Matplotlib



Sneha Mandal



Introduction

Matplotlib is a Python library for creating and presenting visualization of certain data frame. It helps to explore and analyze a dataset in simpler and interactive manner.

There are five key plots that are mostly used for visualization:

- Bar Graph
- Histogram
- Scatter Plot
- Area Plot
- Pie Chart

Further these charts can be customized according to need by specifying various things like legend, title, size of the chart, colors of visualizations, etc.



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Importing Libraries

```
In [1]: import numpy as np  
import matplotlib.pyplot as plt  
import warnings  
  
warnings.filterwarnings('ignore')
```

```
In [2]: #making arrays using numpy  
  
x=np.arange(0,20)  
y=np.arange(21,41)
```

```
In [4]: x
```

```
Out[4]: array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,  
    17, 18, 19])
```

```
In [5]: y
```

```
Out[5]: array([21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37,  
    38, 39, 40])
```

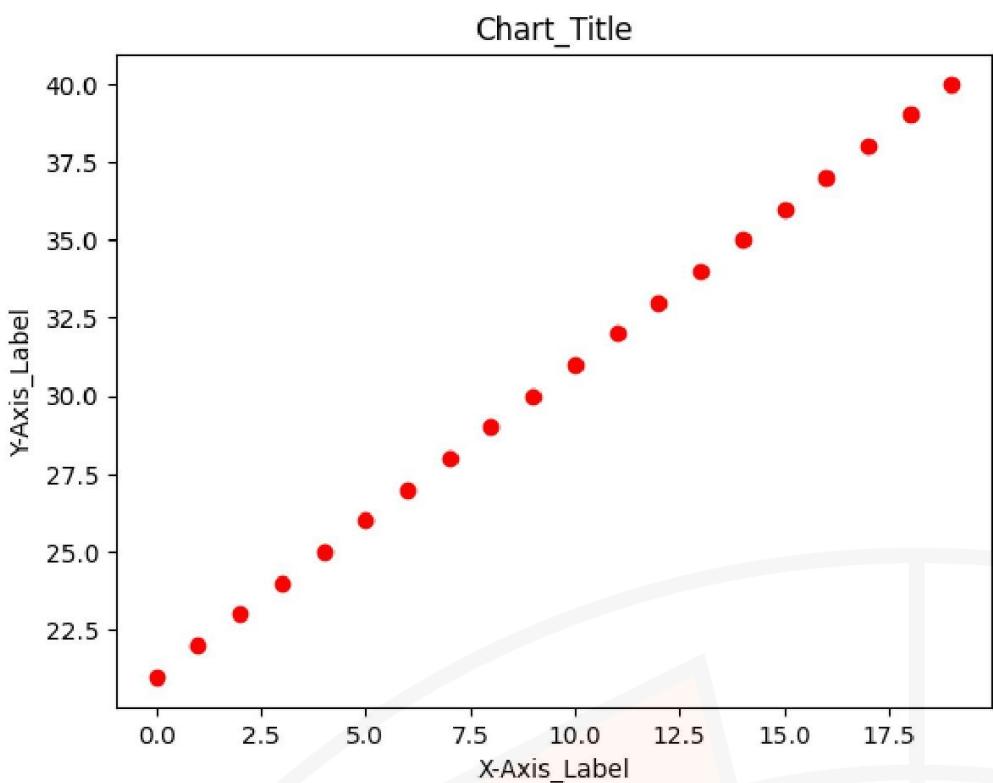
Scatter Plot

```
In [6]: #plt.scatter(x_axis, y_axis, color, color_map, size, ...)  
plt.scatter(x, y, c='r')  
plt.xlabel('X-Axis_Label')  
plt.ylabel('Y-Axis_Label')  
plt.title('Chart_Title')  
  
plt.show()
```



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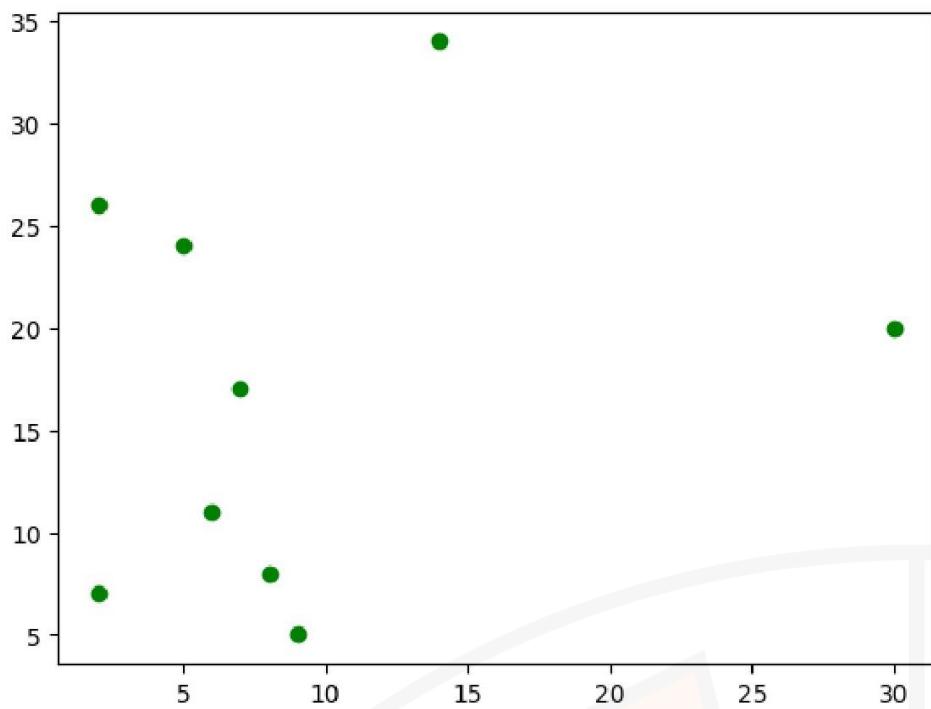


```
In [11]: #compare plot using scatter plot  
a= np.array([2,5,6,9,14,30,2,7,8])  
b= np.array([7,24,11,5,34,20,26,17,8])  
plt.scatter(a, b, c='g')  
plt.show()
```



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Plot

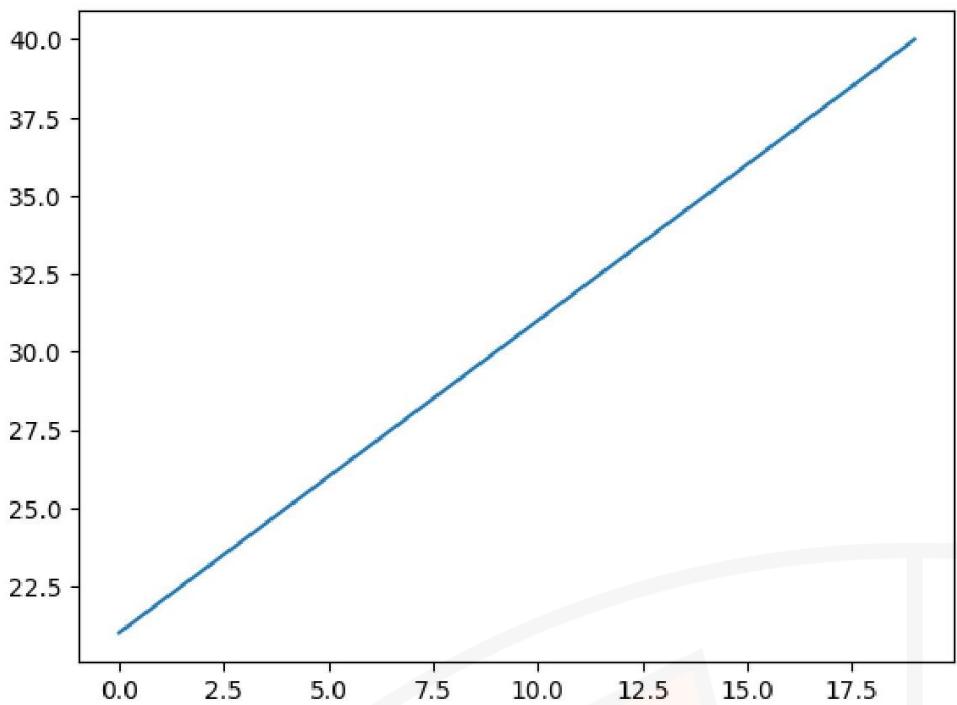
This is used to draw or plot points in a diagram for a particular function.

```
In [12]: plt.plot(x,y)  
plt.show()
```

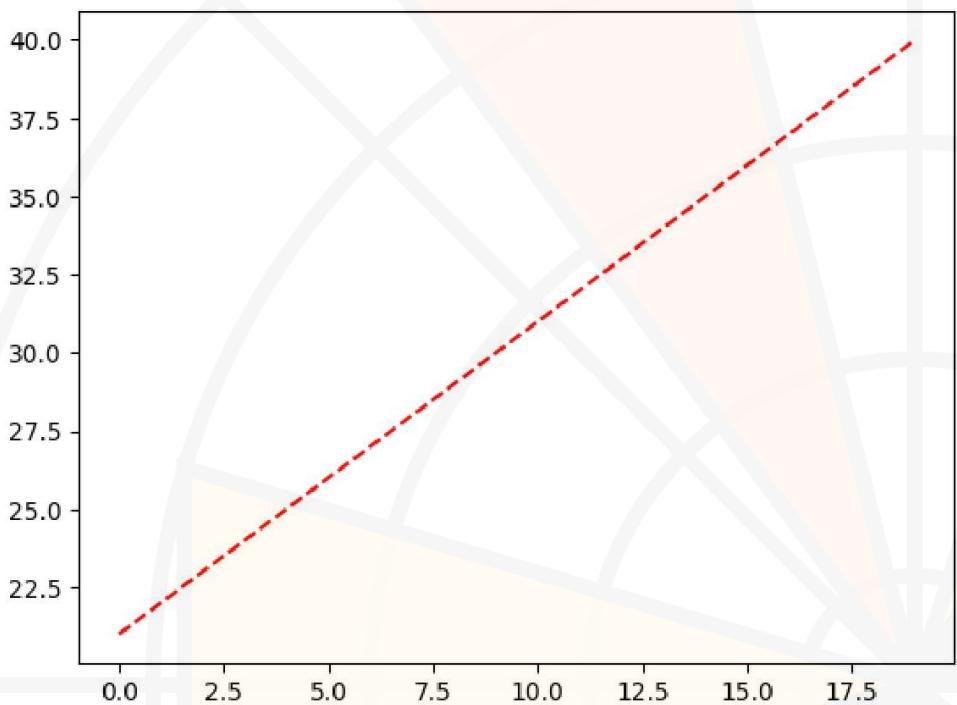


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```
In [14]: plt.plot(x, y, linestyle='dashed', color='red')  
plt.show()
```



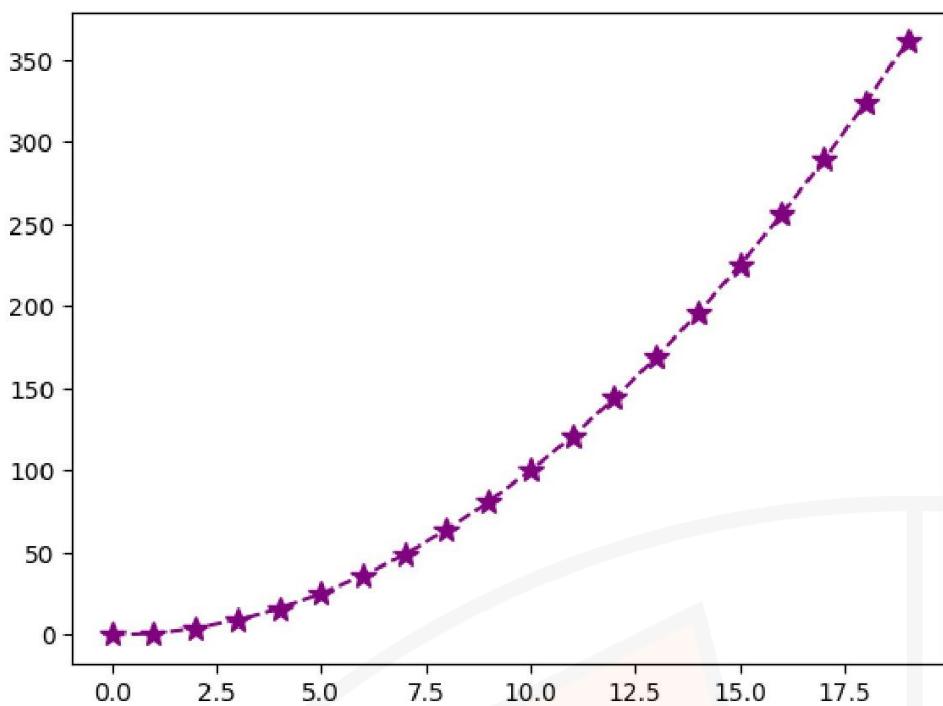
```
In [17]: plt.plot(x, x*x, marker='*', linestyle='dashed', color='purple',  
markerSize=10)
```



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```
plt.show()
```



```
In [53]: # you can make a plot of sine or cosine like this
```

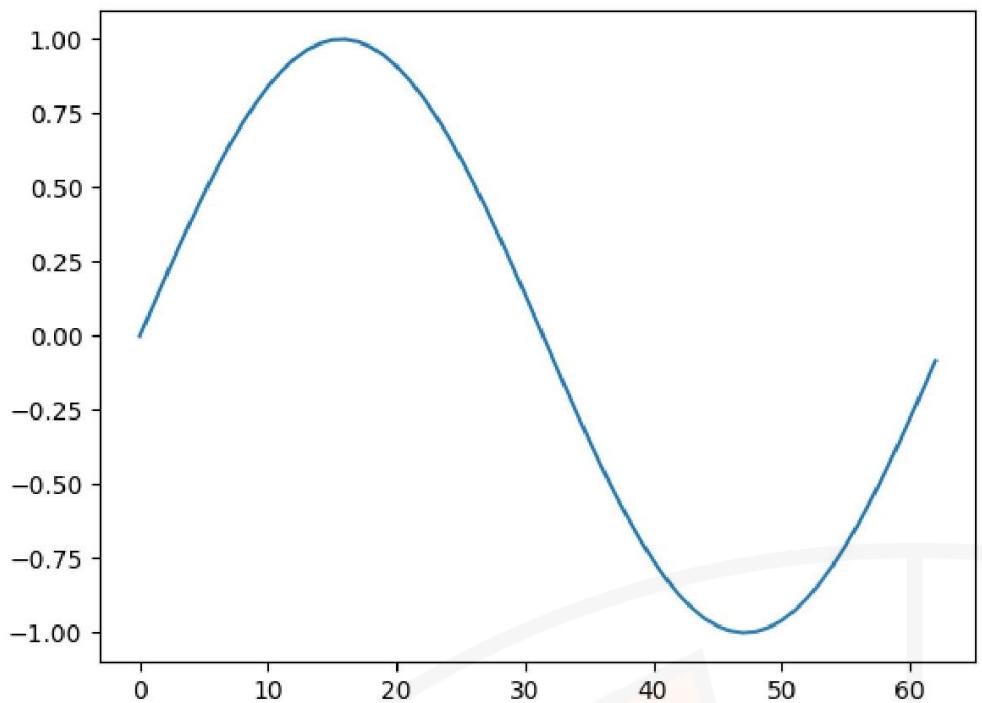
```
x= np.arange(0, 2*np.pi, 0.1)
y= np.sin(x)

plt.plot(y)
plt.show()
```



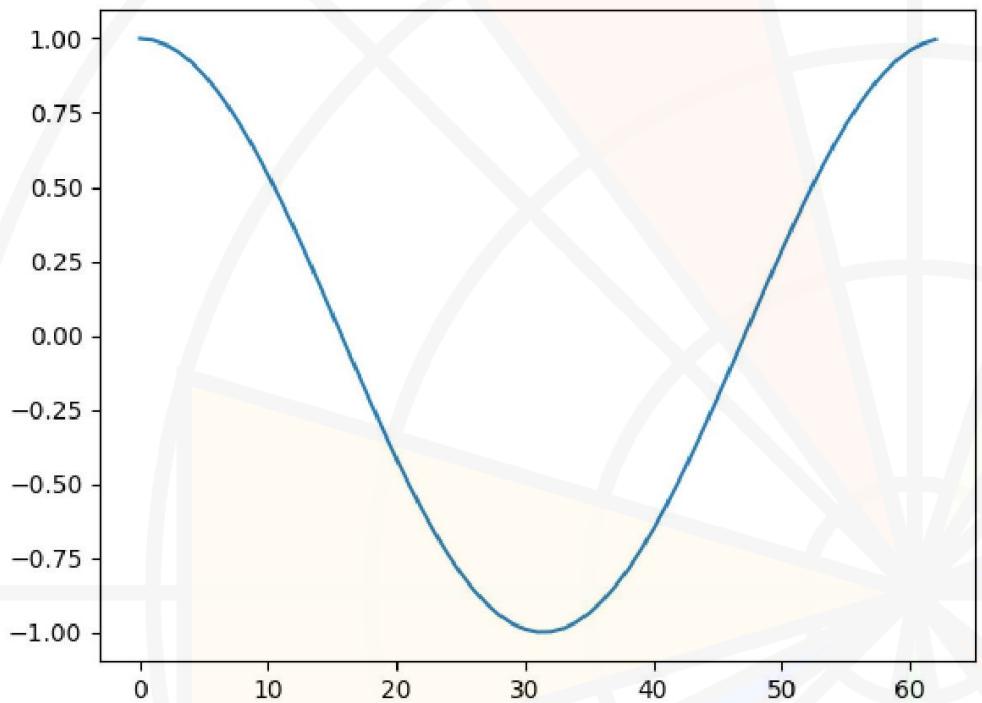
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```
In [54]: x= np.arange(0, 2*np.pi, 0.1)
y= np.cos(x)

plt.plot(y)
plt.show()
```



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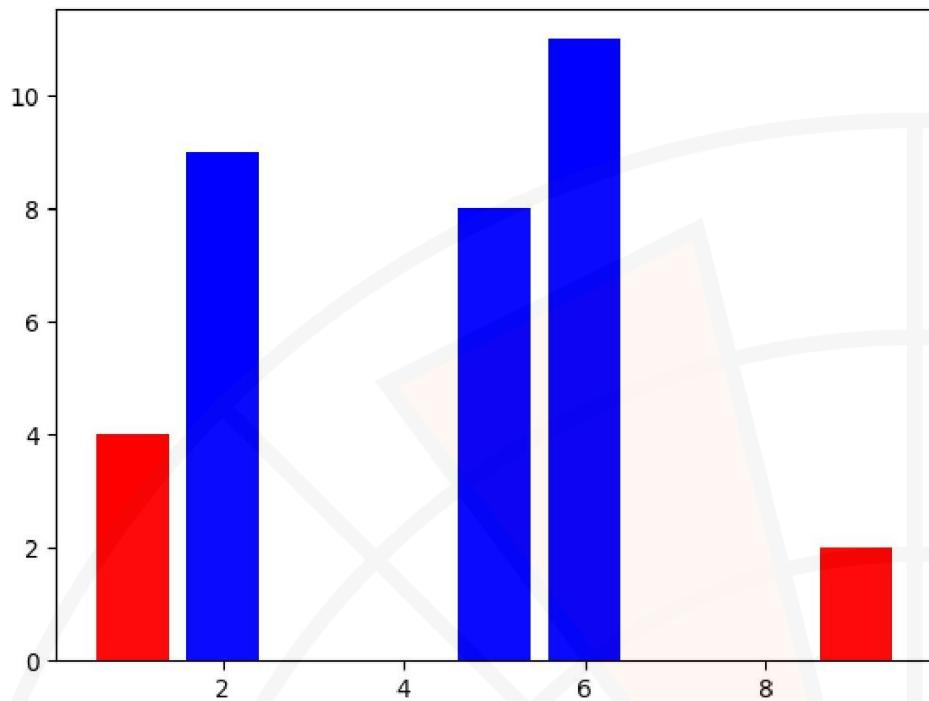


Bar Plot

```
In [21]: x=[1,5,9]
y=[4,7,2]

a=[5,6,2]
b=[8,11,9]

plt.bar(x, y, color='red')
plt.bar(a, b, color='blue')
plt.show()
```



Histogram

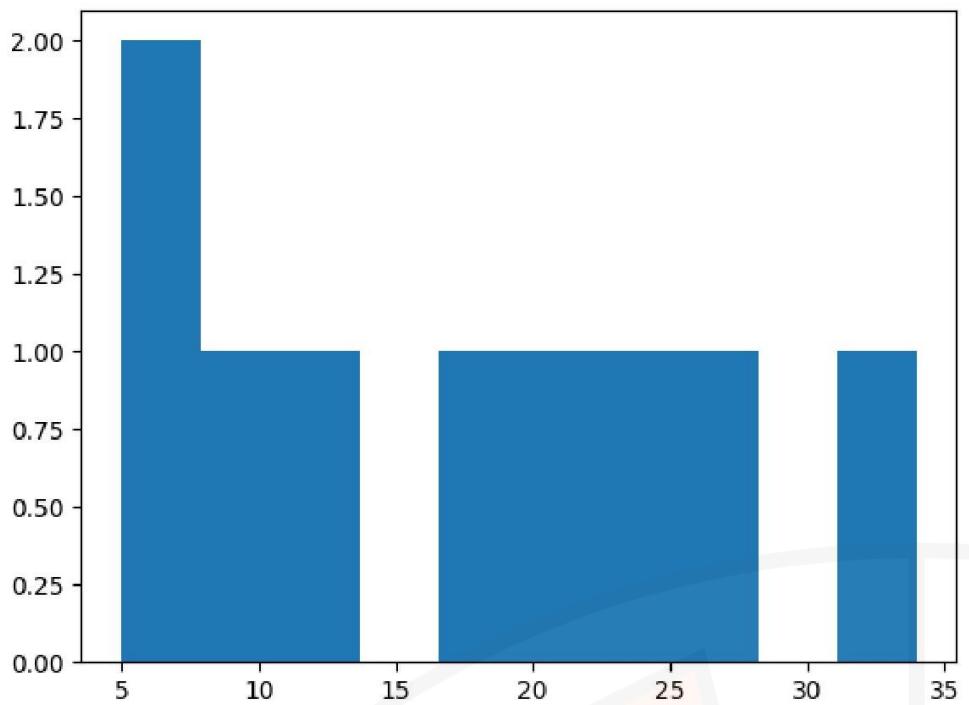
```
In [26]: x= np.array([7,24,11,5,34,20,26,17,8])

plt.hist(x)
plt.show()
```



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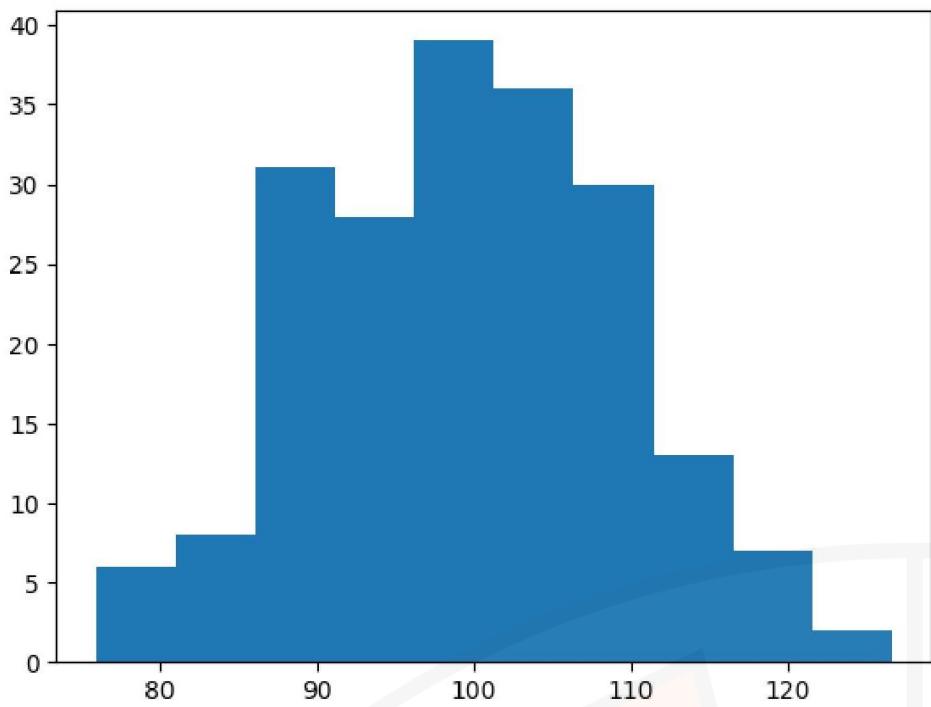


```
In [29]: #normal distribution histogram  
x= np.random.normal(100,10,200)  
plt.hist(x)  
plt.show()
```



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Pie Chart

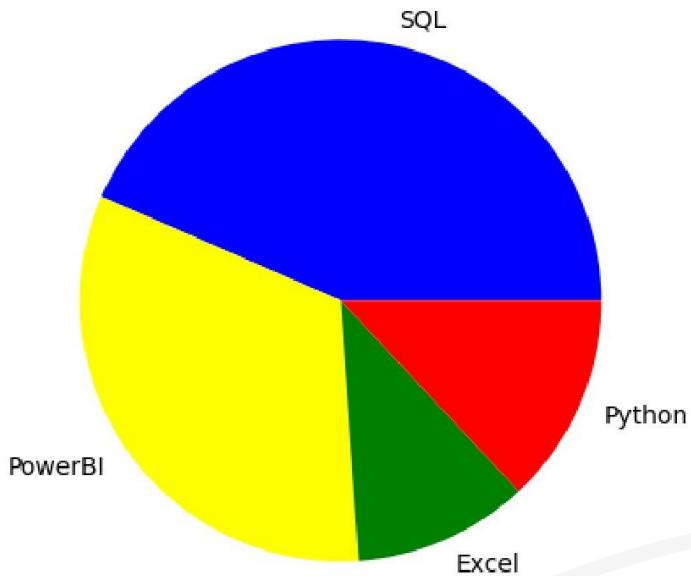
```
In [31]: labels= ['SQL', 'PowerBI', 'Excel', 'Python']
size= [200, 150, 50, 60]
colors= ['blue', 'yellow', 'green', 'red']

plt.pie(size, labels=labels, colors=colors)
plt.show()
```



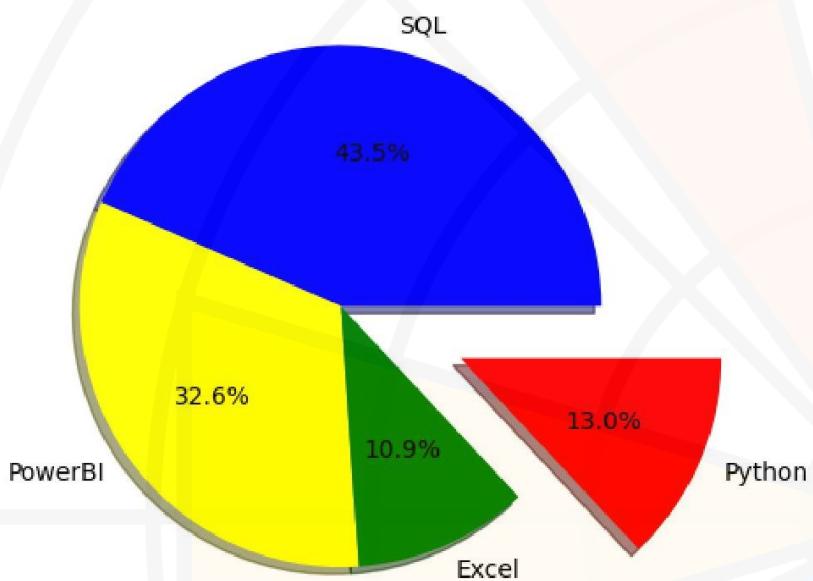
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```
In [33]: labels= ['SQL', 'PowerBI', 'Excel', 'Python']
size= [200, 150, 50, 60]
colors= ['blue', 'yellow', 'green', 'red']
explode= (0, 0, 0, 0.5)

plt.pie(size, labels=labels, colors=colors, explode=explode,
        autopct='%.1f%%', shadow=True)
plt.show()
```

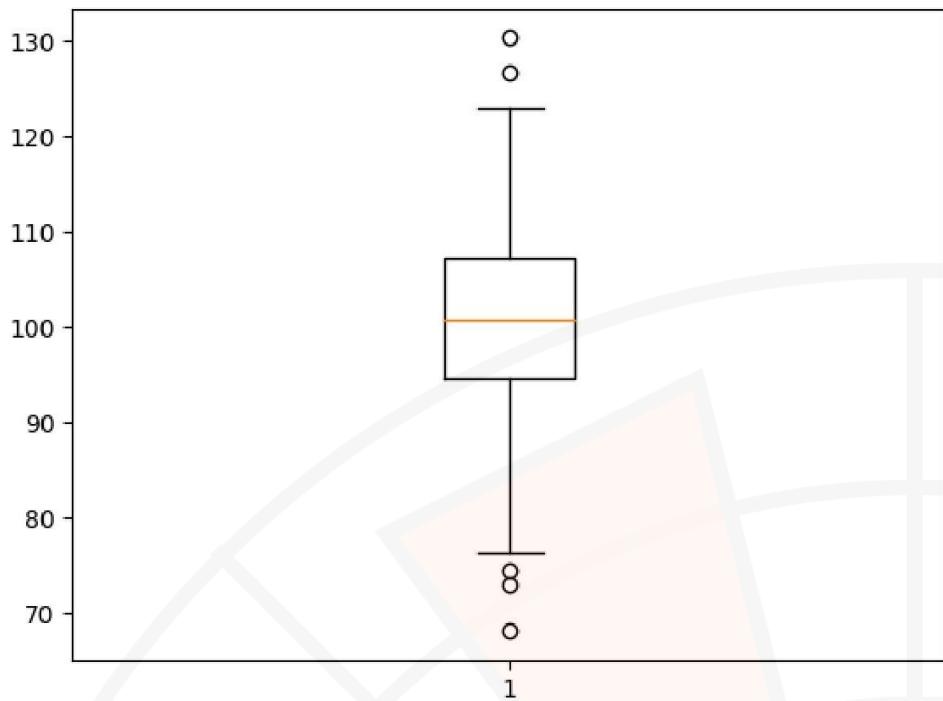


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Box Plot

```
In [34]: x = np.random.normal(100,10,200)  
plt.boxplot(x)  
plt.show()
```

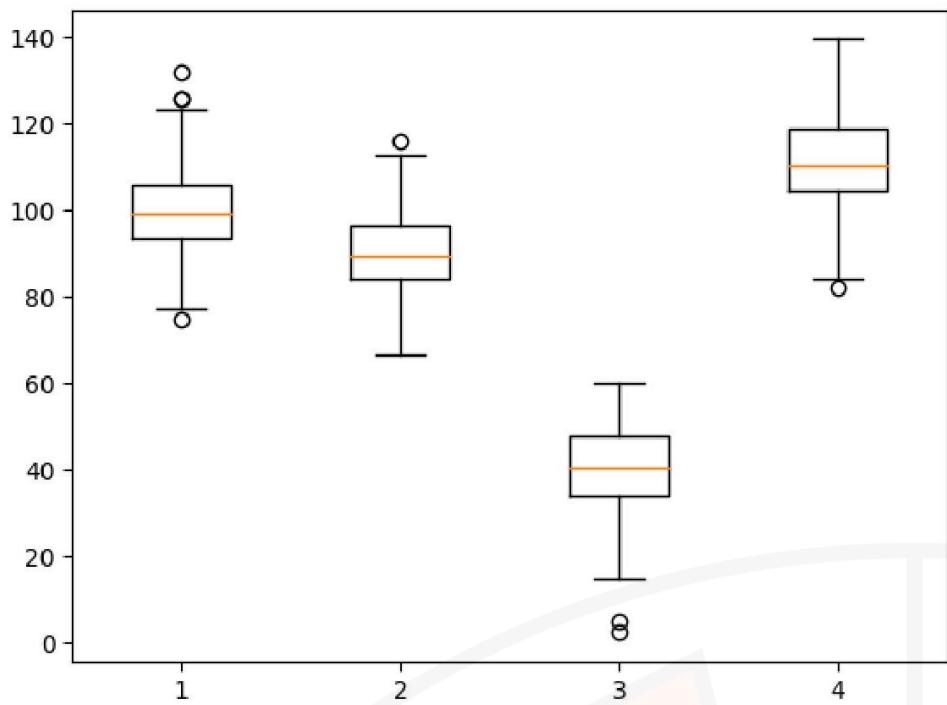


```
In [35]: x = np.random.normal(100,10,200)  
y = np.random.normal(90,10,190)  
a = np.random.normal(40,10,100)  
b = np.random.normal(110,10,190)  
data=[x, y, a, b]  
  
plt.boxplot(data)  
plt.show()
```



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Subplots

```
In [51]: x=np.arange(0,10)
y= x*x

plt.subplot(2,2,1)
plt.plot(x, y, linestyle='dashed', color='purple')

plt.subplot(2,2,2)
plt.plot(x, y, 'ro')

plt.subplot(2,2,3)
plt.plot(x, y, 'b*--')

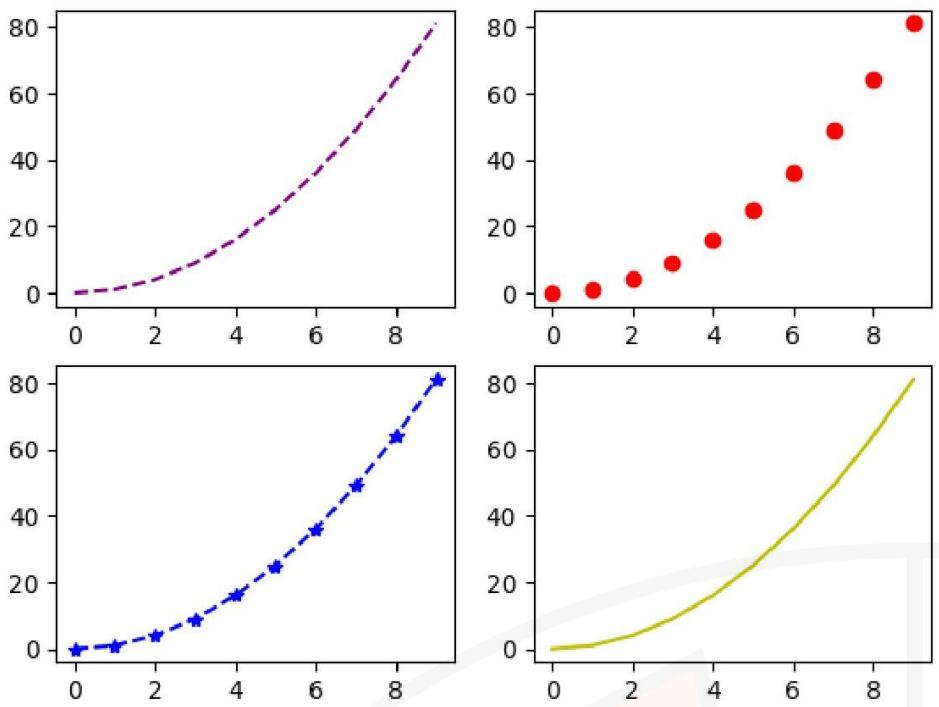
plt.subplot(2,2,4)
plt.plot(x, y, 'y')

plt.show()
```



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**What's your
take from
this???**



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