



D.ATA SCIENCE INTER.NSHIP

Session 7

HDLC TECHNOLOGIES

What is Matplotlib?

- Matplotlib is a basic graph plotting library in python that serves as a visualization utility.
- Matplotlib was created by John D. Hunter.
- Matplotlib is open source and we can use it freely.
- Matplotlib is mostly written in python, a few segments are written in C.

Installation of Matplotlib

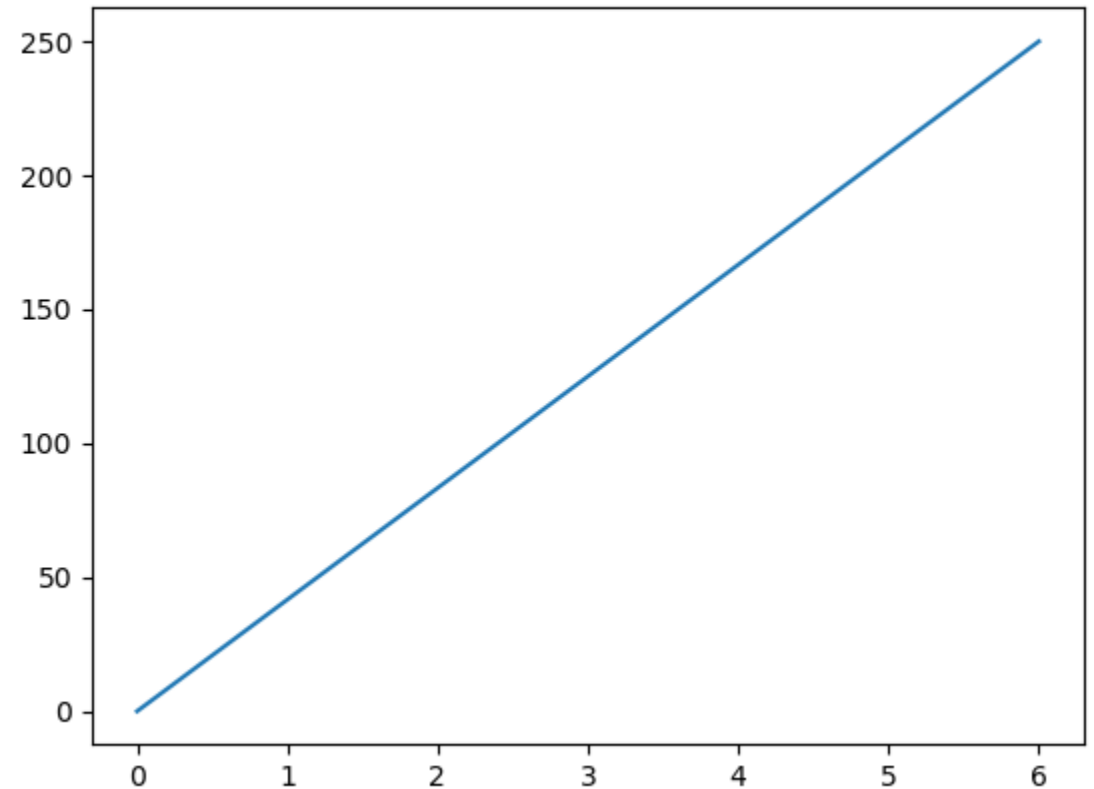
- `pip install matplotlib`

Matplotlib Pyplot

```
import matplotlib.pyplot as plt  
import numpy as np
```

```
xpoints = np.array([0, 6])  
ypoints = np.array([0, 250])
```

```
plt.plot(xpoints, ypoints)  
plt.show()
```

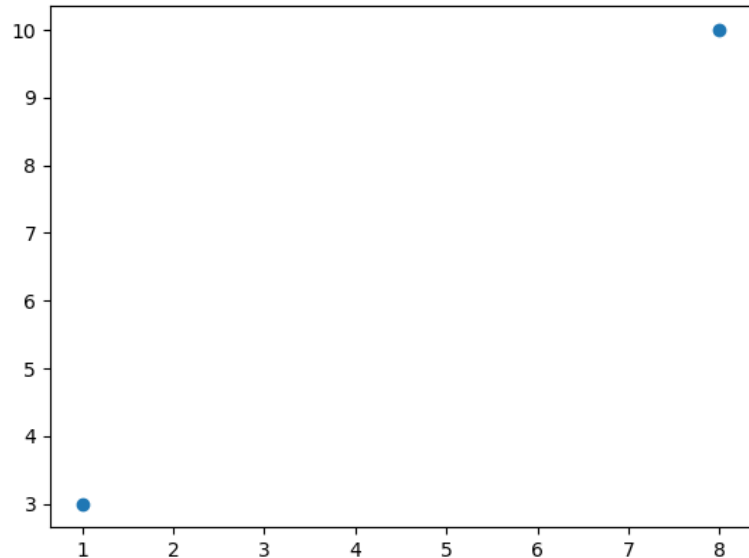


Plotting Without Line

- `import matplotlib.pyplot as plt`
`import numpy as np`

```
xpoints = np.array([1, 8])  
ypoints = np.array([3, 10])
```

```
plt.plot(xpoints, ypoints, 'o')  
plt.show()
```

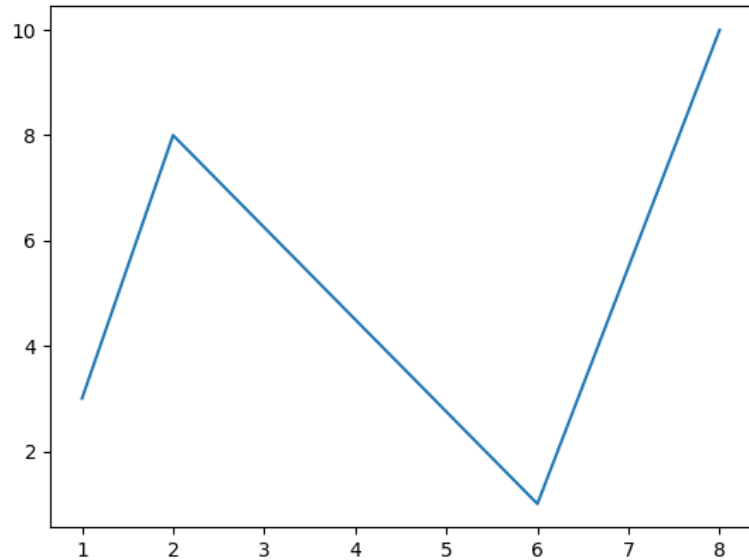


Multiple Points

- `import matplotlib.pyplot as plt`
`import numpy as np`

```
xpoints =  
np.array([1, 2, 6, 8])  
ypoints =  
np.array([3, 8, 1, 10])
```

```
plt.plot(xpoints, ypoints)  
plt.show()
```

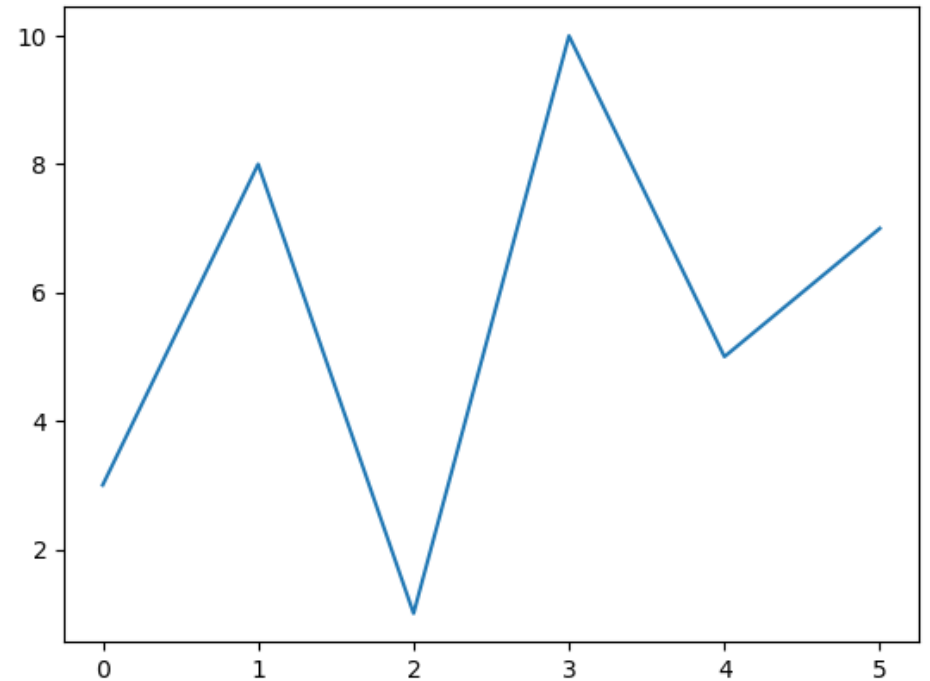


Default X-Points

- ```
import matplotlib.pyplot as plt
import numpy as np

ypoints =
np.array([3, 8, 1, 10, 5, 7])

plt.plot(ypoints)
plt.show()
```



# Matplotlib Markers

- ```
import matplotlib.pyplot as plt  
import numpy as np  
  
ypoints =  
np.array([3, 8, 1, 10])  
  
plt.plot(ypoints, marker = 'o')  
plt.show()
```



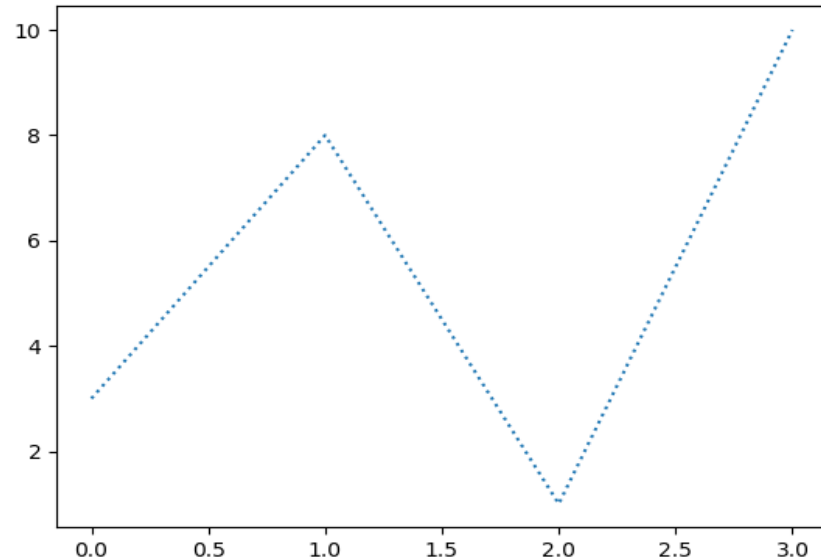
Matplotlib Line

- `import matplotlib.pyplot as plt`
`import numpy as np`

```
ypoints =  
np.array([3, 8, 1, 10])
```

```
plt.plot(ypoints, linestyle  
= 'dotted')  
plt.show()
```

- Result:



Matplotlib Labels and Title

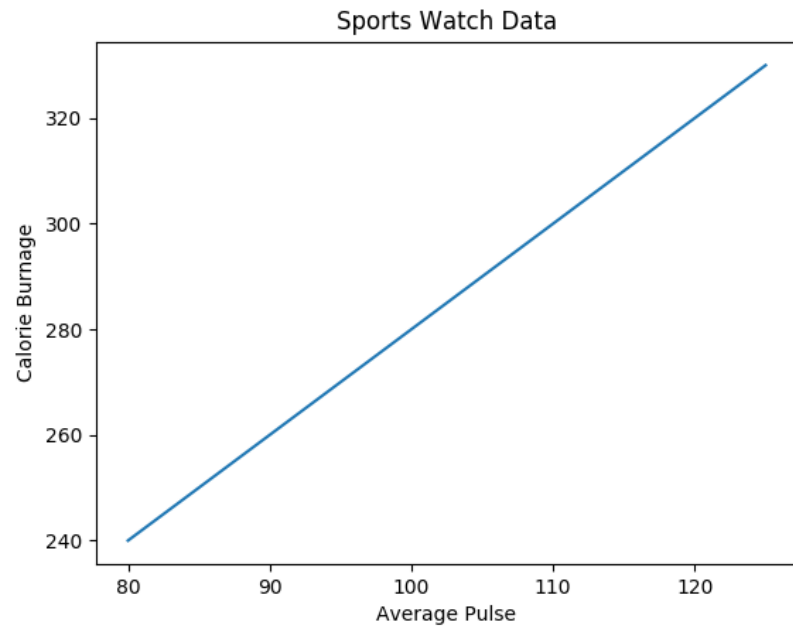
- ```
import numpy as np
import matplotlib.pyplot as plt

x =
np.array([80, 85, 90, 95, 100, 105, 110, 115
, 120, 125])
y =
np.array([240, 250, 260, 270, 280, 290, 300,
310, 320, 330])

plt.plot(x, y)

plt.title("Sports Watch Data")
plt.xlabel("Average Pulse")
plt.ylabel("Calorie Burnage")

plt.show()
```



# Matplotlib Adding Grid Lines

```
• import numpy as np
 import matplotlib.pyplot as plt

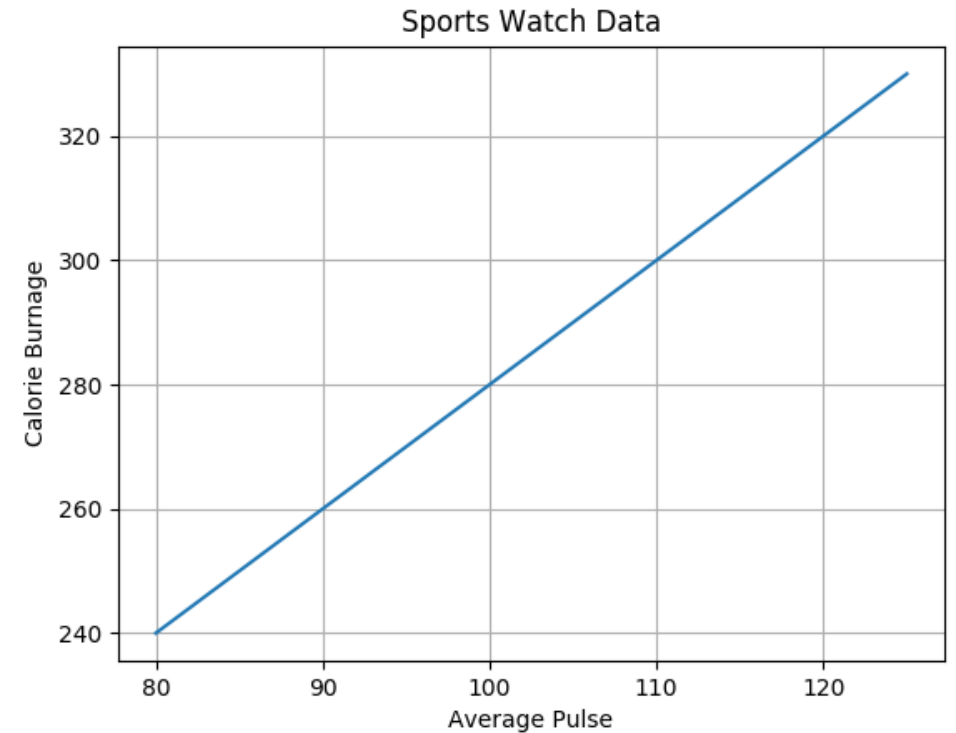
 x =
 np.array([80, 85, 90, 95, 100, 105, 110, 115, 120, 125])
 y =
 np.array([240, 250, 260, 270, 280, 290, 300, 310, 320, 330])

 plt.title("Sports Watch Data")
 plt.xlabel("Average Pulse")
 plt.ylabel("Calorie Burnage")

 plt.plot(x, y)

 plt.grid()

 plt.show()
```



# Matplotlib Subplot

- `import matplotlib.pyplot as plt`  
`import numpy as np`

#plot 1:

```
x = np.array([0, 1, 2, 3])
y = np.array([3, 8, 1, 10])
```

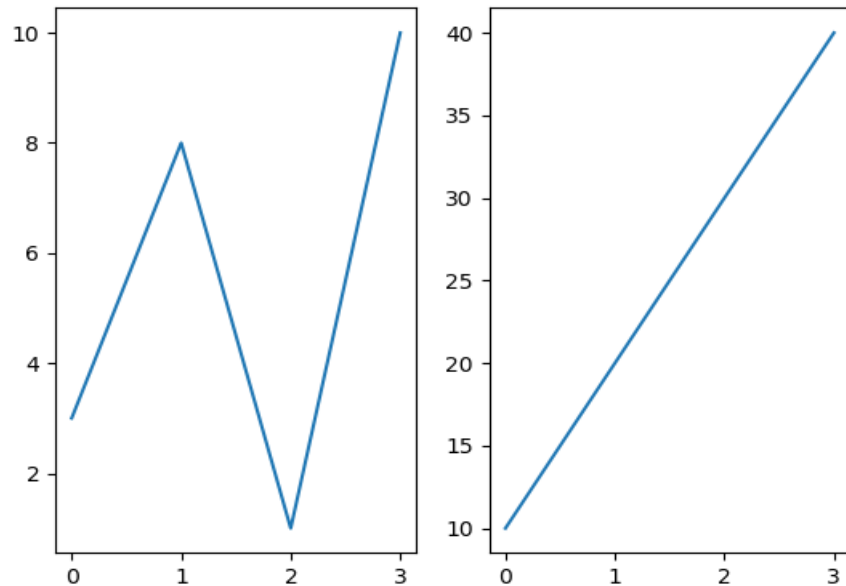
```
plt.subplot(1, 2, 1)
plt.plot(x,y)
```

#plot 2:

```
x = np.array([0, 1, 2, 3])
y = np.array([10, 20, 30, 40])
```

```
plt.subplot(1, 2, 2)
plt.plot(x,y)
```

```
plt.show()
```

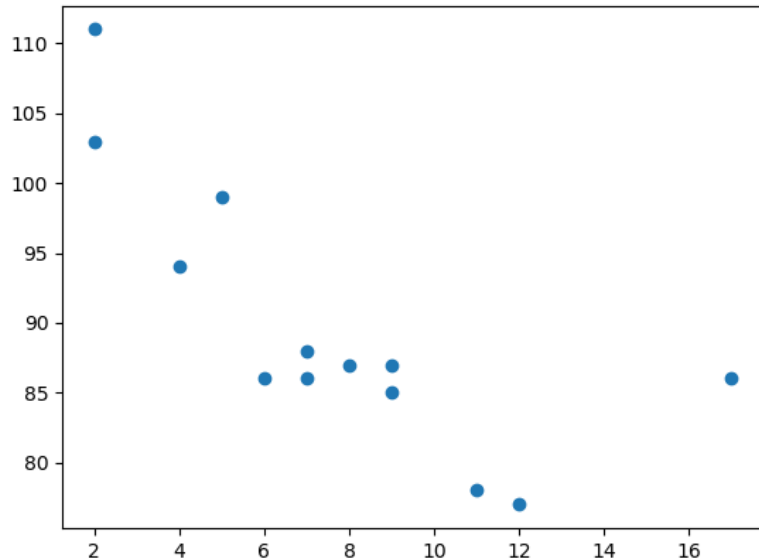


# Matplotlib Scatter

- `import matplotlib.pyplot as plt`  
`import numpy as np`

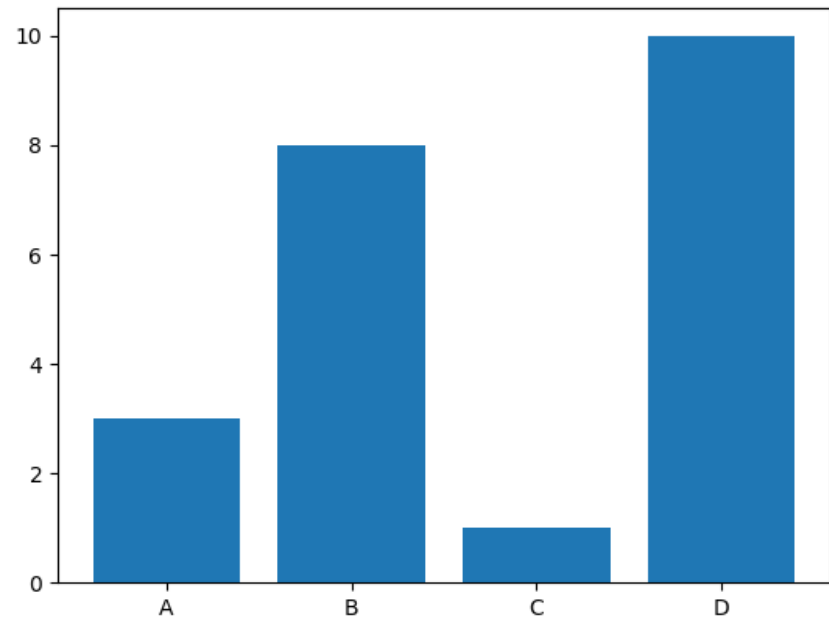
```
x =
np.array([5,7,8,7,2,17,2,9,4,11,
 12,9,6])
y =
np.array([99,86,87,88,111,86,10
 3,87,94,78,77,85,86])
```

```
plt.scatter(x, y)
plt.show()
```



# Creating Bars

- ```
import matplotlib.pyplot  
as plt  
import numpy as np  
  
x =  
np.array(["A", "B", "C",  
"D"])  
y =  
np.array([3, 8, 1, 10])  
  
plt.bar(x,y)  
plt.show()
```

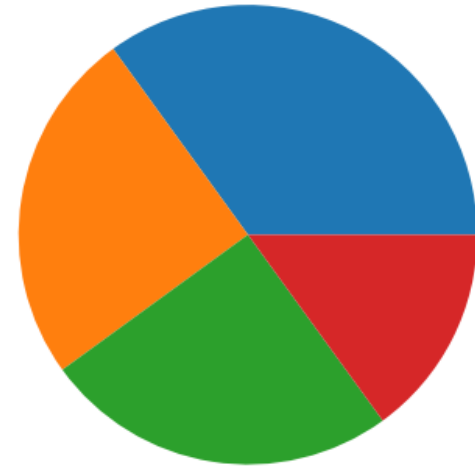


Matplotlib Pie Charts

- `import matplotlib.pyplot as plt`
`import numpy as np`

`y = np.array([35, 25, 25, 15])`

`plt.pie(y)`
`plt.show()`



Matplotlib Histograms

- `import matplotlib.pyplot as plt`
`import numpy as np`

`x = np.random.normal(170, 10, 250)`

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

