

# DATA VISUALIZATION

## CSE3020

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## SIMPLE PLOT USING MATPLOTLIB

```
import matplotlib.pyplot as mpl  
mpl.plot([1,2,3,2,3,2,2,1])  
mpl.show()
```

- The basic elements in matplotlib in plot are:
  - **x and y axes:** Horizontal and Vertical axes
  - **x and y tickers:** denoting the segments of axes
  - **x and y tick labels:** represents the values on particular axis
  - **Plotting area:** where the actual plots are drawn
- In the above example, the values we provided to plot() are y axis values and plot() provides default values for the x axis  $\rightarrow$  0 to 7.

## SIMPLE PLOT USING MATPLOTLIB

```
import matplotlib.pyplot as mpl
x = [1,2,3,4]
y = [5,4,3,2]
mpl.figure()
#mpl.show()
# check the output upto this
mpl.subplot(231)
#mpl.show()
#check the output upto this
#mpl.subplot(231)
mpl.plot(x,y)
#mpl.show()
mpl.subplot(232)
mpl.ylabel("Numbers")
mpl.xlabel("degault _numbers")
```

## SIMPLE PLOT USING MATPLOTLIB

```
mpl.show()
mpl.subplot(234)
x10= [1,2,3,4]
y10= [1,4,9,16]
mpl.ylabel("marks")
mpl.xlabel("Reg.No")
mpl.plot(x10,y10, 'ro') #ro, r*, r+, r-,
mpl.axis([0,6, 0,20])
mpl.show()
```

## EXAMPLE

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

t = np.arange(0., 5., 0.2)
print(t)
# red dashes, blue squares and green triangles
plt.plot(t, t, 'r—', t, t**2, 'bs', t, t**3, 'g^')
plt.show()
```

## EXAMPLE

```
import matplotlib.pyplot as plt

# Sample data:
x = range(0, 13)
y = [[i * j for i in x] for j in x]
print(x)
#print(y)

# Blue (default):
plt.plot(x, y[11])
plt.plot(x, y[10], 'b')
plt.plot(x, y[9], 'blue')
plt.plot(x, y[8], color='b')
plt.plot(x, y[7], '#0000ff')
```

## BAR PLOTS

```
import matplotlib.pyplot as mpl
x = [1,2,3,4]
y = [5,4,3,2]
# bar plots
mpl.subplot(232)
mpl.bar(x,y)
mpl.show()

#horizontal bar-charts
mpl.subplot(233)
mpl.barh(x,y)
mpl.show()
```

## STACKED BAR CHARTS

```
import matplotlib.pyplot as mpl
x = [1,2,3,4]
y = [5,4,3,2]
y1 = [7,8,5,3]
mpl.bar(x,y,color='g')
mpl.bar(x,y1,bottom=y,color='r')
mpl.show()
```



## Box Plot

```
import matplotlib.pyplot as mpl  
x = [1,2,3,4]  
mpl.boxplot(x)  
mpl.show()
```

## Box Plot

```
import matplotlib.pyplot as mpl
dataset = [113, 115, 119, 121, 124,
           124, 125, 126, 126, 126,
           127, 127, 128, 129, 130,
           130, 131, 132, 133, 136]

mpl.boxplot(dataset , vert=False)
mpl.show()
```

## SCATTER PLOTS

```
import matplotlib.pyplot as mpl  
x = [1,2,3,4]  
y = [5,4,3,2]  
mpl.scatter(x,y)  
mpl.show()
```

## SCATTER PLOTS

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

n = 100
r = 2 * np.random.rand(n)
theta = 2 * np.pi * np.random.rand(n)
area = 200 * r**2 * np.random.rand(n)
colors = theta
plt.subplot(231)
plt.scatter(theta, r, c=colors, s=area, cmap=plt.cm.RdYiG)
plt.subplot(232)
plt.scatter(theta, r, c=colors, s=area, cmap=plt.cm.Blues)
plt.subplot(233)
plt.scatter(theta, r, c=colors, s=area, cmap=plt.cm.BrBG)
plt.subplot(234)
```

## HISTOGRAM

```
import matplotlib.pyplot as mpl  
dataset = [113, 115, 119, 121, 124,  
           124, 125, 126, 126, 126,  
           127, 127, 128, 129, 130,  
           130, 131, 132, 133, 136]  
  
mpl.hist(dataset)  
mpl.show()
```