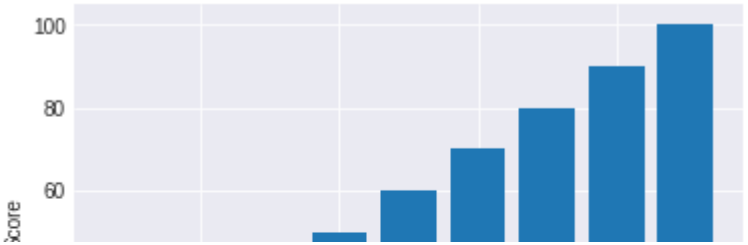
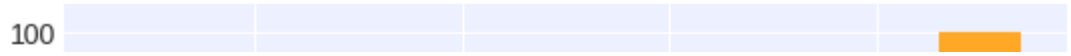
```
import numpy as np
import pandas as pd
import matplotlib as mpl
import matplotlib.pyplot as plt
%matplotlib inline

#Graph Styling
# https://tonysyu.github.io/raw_content/matplotlib-style-gallery/gallery.html
plt.style.use('seaborn-darkgrid')
```

Bar Graphs

```
#Simple Bar Chart
id1 = np.arange(1,10)
score = np.arange(20,110,10)
plt.bar(id1,score)
#plt.xticks(id1)
plt.xlabel('Student ID')
plt.ylabel('Score')
plt.show()
```

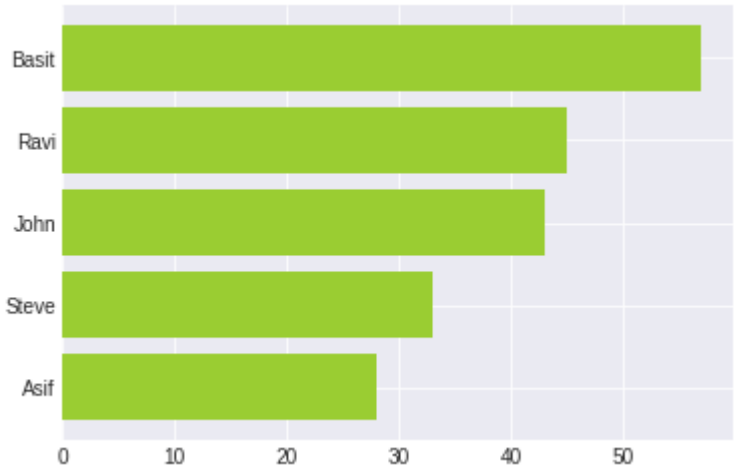



```
# Changing color of the bar chart
id1 = np.arange(1,10)
score = np.arange(20,110,10)
plt.figure(figsize=(8,5)) # Setting the figure size
ax = plt.axes()
ax.set_facecolor("#ECF0FF") # Setting the background color by specifying the HEX Code
plt.bar(id1,score,color = '#FFA726')
plt.xlabel(r'$Student   $  $ ID$')
plt.ylabel(r'$Score$')
plt.show()
```



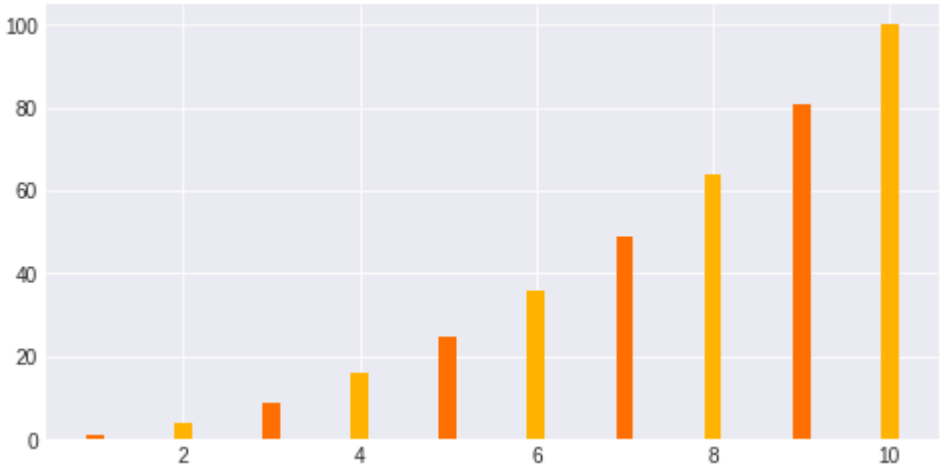

```
#Plotting multiple sets of data
x1= [1,3,5,7]
x2=[2,4,6,8]
y1 = [7,7,7,7]
y2= [17,18,29,40]
plt.figure(figsize=(8,6))
ax = plt.axes()
ax.set_facecolor("white")
plt.bar(x1,y1,label = "First",color = '#42B300') # First set of data
plt.bar(x2,y2,label = "Second",color = '#94E413') # Second set of data
plt.xlabel('$X$')
plt.ylabel('$Y$')
plt.title ('$Bar $ $ Chart$')
plt.legend()
plt.show()
```


```
# Horizontal Bar Chart
Age = [28,33,43,45,57]
Name = ["Asif", "Steve", 'John', "Ravi", "Basit"]
plt.barh(Name,Age, color ="yellowgreen")
plt.show()
```



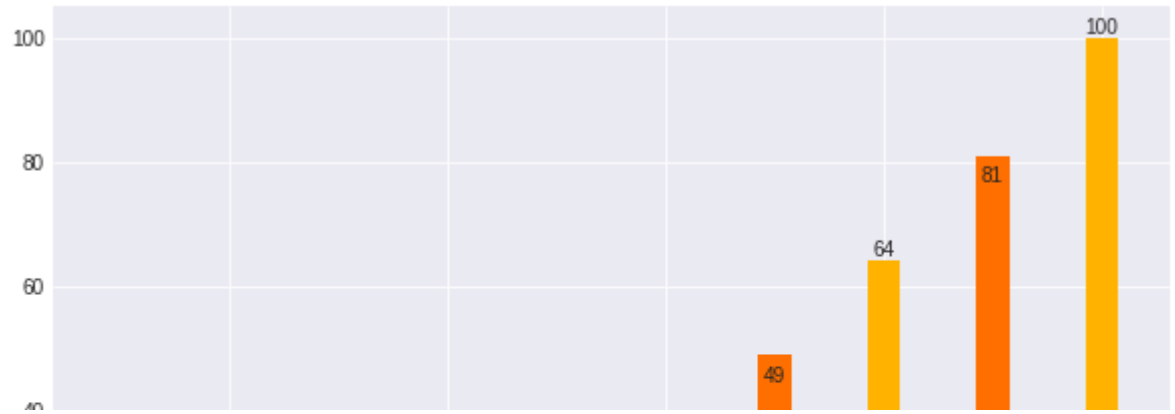

```
# Changing the width of Bars
num1 = np.array([1,3,5,7,9])
num2 = np.array([2,4,6,8,10])
plt.figure(figsize=(8,4))
plt.bar(num1, num1**2, width=0.2 , color = '#FF6F00')
plt.bar(num2, num2**2, width=0.2 , color = '#FFB300')
plt.plot()
```

[ ]

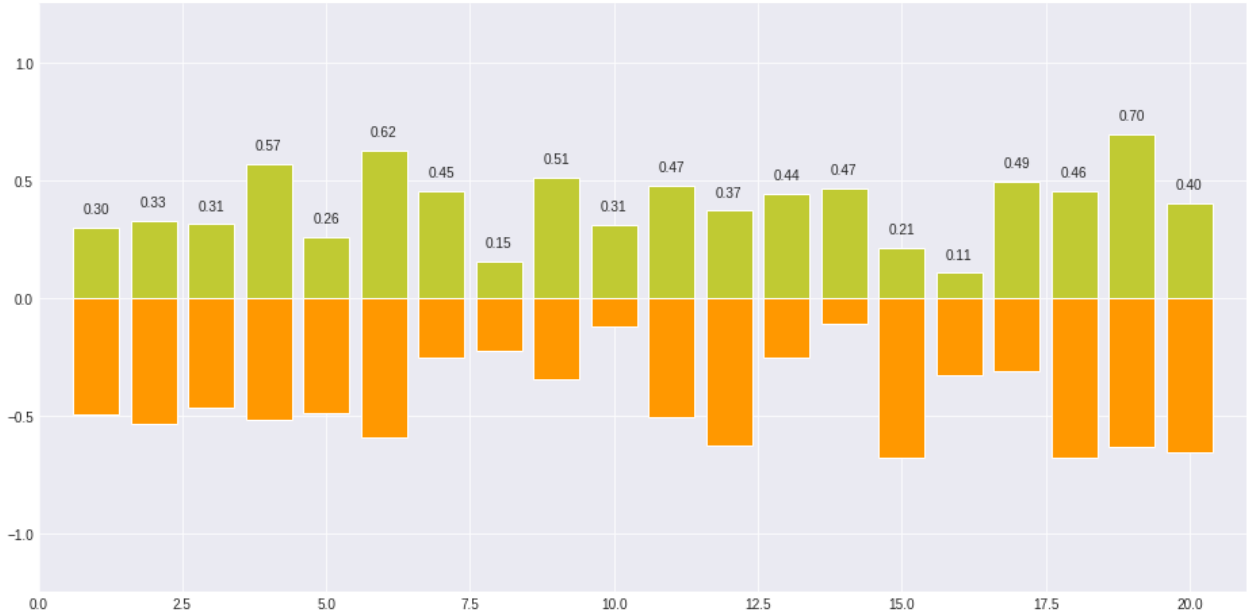



```
# Displaying values at the top of vertical bars
num1 = np.array([1,3,5,7,9])
num2 = np.array([2,4,6,8,10])
plt.figure(figsize=(10,6))
plt.bar(num1, num1**2, width=0.3 , color = '#FF6F00')
plt.bar(num2, num2**2, width=0.3 , color = '#FFB300')
for x,y in zip(num1,num1**2):
    plt.text(x, y-5, '%d' % y, ha='center' , va= 'bottom')
for x,y in zip(num2,num2**2):
    plt.text(x, y+0.05, '%d' % y, ha='center' , va= 'bottom')
plt.plot()
```

[]



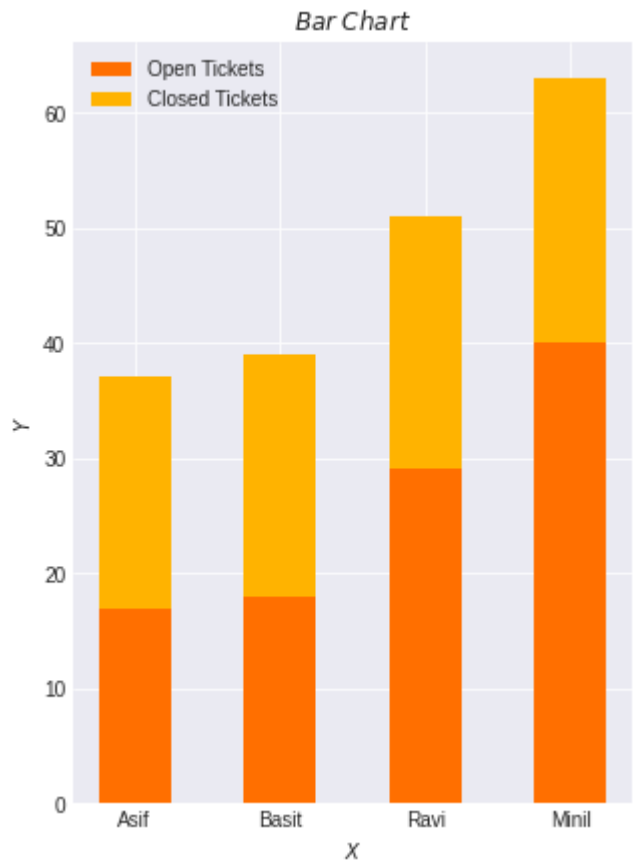

```
x = np.arange(1,21)
plt.figure(figsize=(16,8))
y1 = np.random.uniform(0.1,0.7,20)
y2 = np.random.uniform(0.1,0.7,20)


plt.bar(x, +y1, facecolor='#C0CA33', edgecolor='white') #specify edgecolor by name
plt.bar(x, -y2, facecolor='#FF9800', edgecolor='white')

for x,y in zip(x,y1):
    plt.text(x, y+0.05, '%.2f' % y, ha='center' , va= 'bottom', fontsize = 10)

plt.xlim(0,21)
plt.ylim(-1.25,+1.25)
plt.show()
```



Stacked Vertical Bar

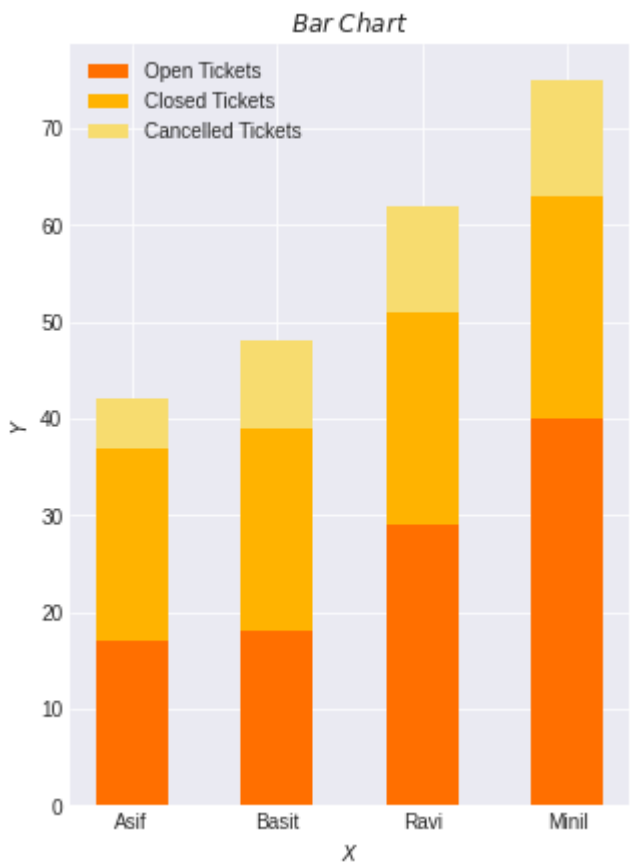
```
plt.style.use('seaborn-darkgrid')
x1= ['Asif','Basit','Ravi','Minil']
y1= [17,18,29,40]
y2 = [20,21,22,23]
plt.figure(figsize=(5,7))
plt.bar(x1,y1,label = "Open Tickets",width = 0.5,color = '#FF6F00')
plt.bar(x1,y2,label = "Closed Tickets",width = 0.5 ,bottom = y1 , color = '#FFB300')
plt.xlabel('$X$')
plt.ylabel('$Y$')
plt.title ('$Bar $ $ Chart$')
plt.legend()
```

```
plt.show()
```




```
plt.style.use('seaborn-darkgrid')
x1= ['Asif','Basit','Ravi','Minil']
y1= np.array([17,18,29,40])
y2 =np.array([20,21,22,23])
y3 =np.array([5,9,11,12])
plt.figure(figsize=(5,7))
plt.bar(x1,y1,label = "Open Tickets",width = 0.5,color = '#FF6F00')
plt.bar(x1,y2,label = "Closed Tickets",width = 0.5 ,bottom = y1 , color = '#FFB300')
plt.bar(x1,y3,label = "Cancelled Tickets",width = 0.5 ,bottom = y1+y2 , color = '#F7DC6
```

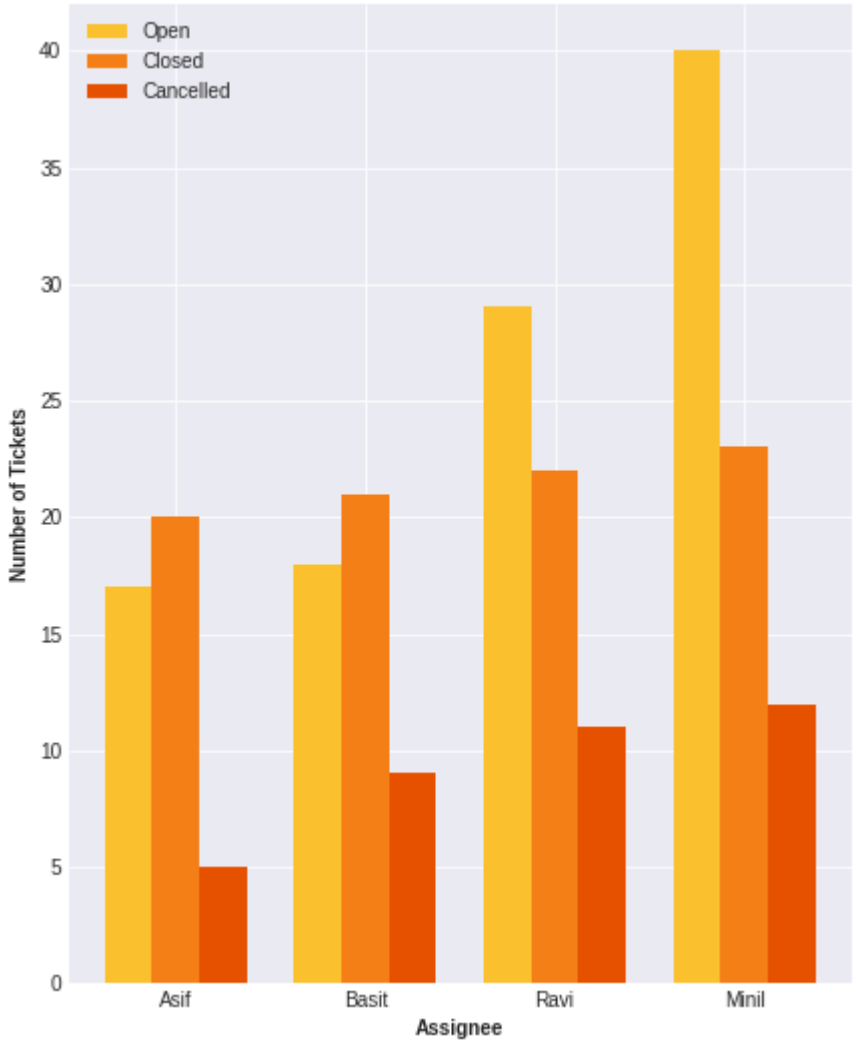
```
plt.xlabel('$X$')
plt.ylabel('$Y$')
plt.title ('$Bar $ $ Chart$')
plt.legend()
plt.show()
```



Grouped Bar Chart

```
# Grouped Bar Chart

plt.figure(figsize=(7,9))
```

```
plt.figure(figsize=(7,9))

# set width of bar
barWidth = 0.25

# set height of bar
y1= np.array([17,18,29,40])
y2 =np.array([20,21,22,23])
y3 =np.array([5,9,11,12])

# Set position of bar on X axis
pos1 = np.arange(len(y1))
pos2 = [x + barWidth for x in pos1]
pos3 = [x + barWidth for x in pos2]

# Make the plot
plt.bar(pos1, y1, color='#FBC02D', width=barWidth, label='Open')
plt.bar(pos2, y2, color='#F57F17', width=barWidth, label='Closed')
plt.bar(pos3, y3, color='#E65100', width=barWidth, label='Cancelled')

# Add xticks on the middle of the group bars
plt.xlabel('Assignee', fontweight='bold')
plt.ylabel('Number of Tickets', fontweight='bold')
plt.xticks([i + barWidth for i in range(len(y1))], ['Asif', 'Basit', 'Ravi', 'Minil'])

# Create legend & Show graphic
plt.legend()
plt.show()
np.arange(len(y1))
```

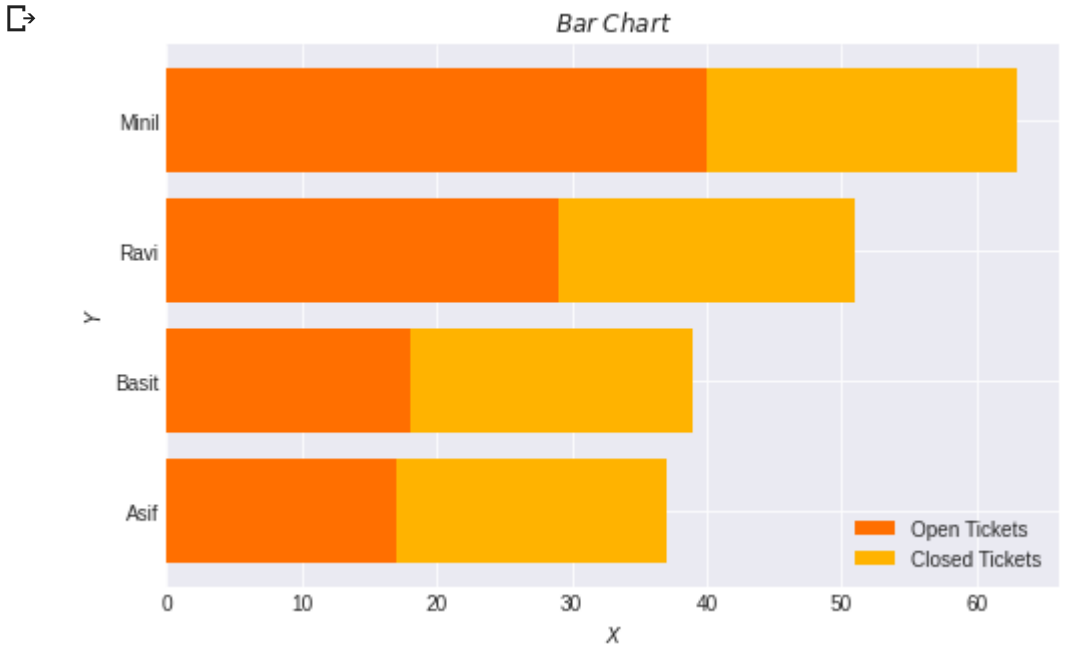



```
array([0, 1, 2, 3])
```

Stacked Vertical Bar

```
plt.style.use('seaborn-darkgrid')
x1= ['Asif','Basit','Ravi','Minil']
y1= [17,18,29,40]
y2 = [20,21,22,23]
```

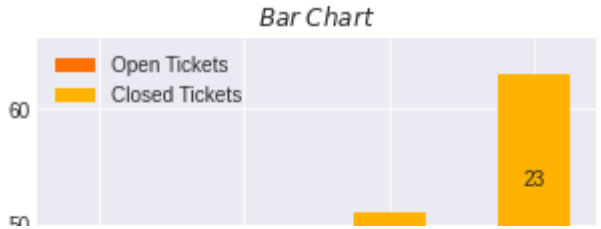
```
plt.figure(figsize=(8,5))
plt.barh(x1,y1,label = "Open Tickets",color = '#FF6F00')
plt.barh(x1,y2,label = "Closed Tickets", left = y1 , color = '#FFB300')
plt.xlabel('$X$')
plt.ylabel('$Y$')
plt.title ('$Bar $ $ Chart$')
plt.legend()
plt.show()
```



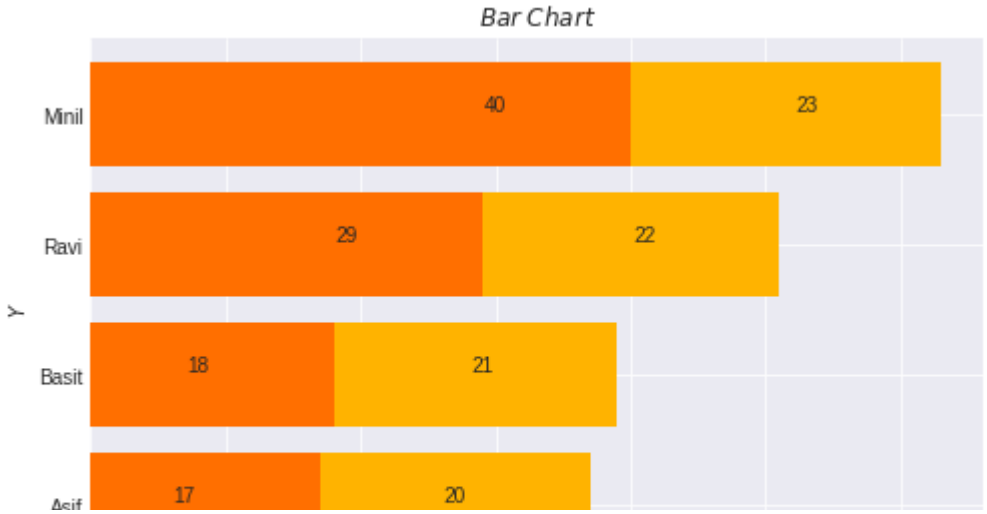
Displaying values in Bar Charts

```
# Displaying values in the stacked vertical bars using plt.text()
plt.style.use('seaborn-darkgrid')
x1= ['Asif','Basit','Ravi','Minil']
y1= [17,18,29,40]
```

```
y2 = [20,21,22,23]
plt.figure(figsize=(5,7))
plt.bar(x1,y1,label = "Open Tickets",width = 0.5,color = '#FF6F00')
plt.bar(x1,y2,label = "Closed Tickets",width = 0.5 ,bottom = y1 , color = '#FFB300')
plt.xlabel('$X$')
plt.ylabel('$Y$')
plt.title ('$Bar $ $ Chart$')
for x,y in zip(x1,y1):
    plt.text(x, y-10, '%d' % y, ha='center' , va= 'bottom')

for x,y,z in zip(x1,y2,y1):
    plt.text(x, y+z-10, '%d' % y, ha='center' , va= 'bottom')

plt.legend()
plt.show()
```

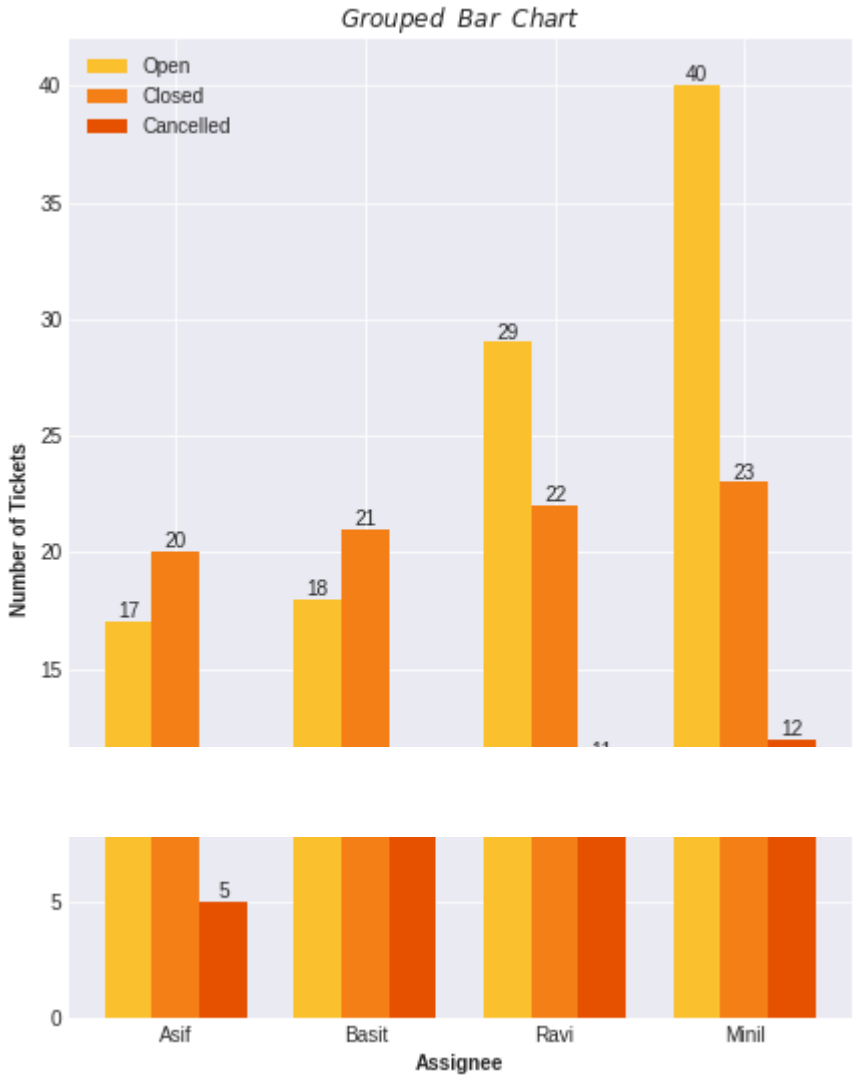



```
# Displaying values in the stacked horizontal bars using plt.text()
plt.style.use('seaborn-darkgrid')
x1= ['Asif','Basit','Ravi','Minil']
y1= [17,18,29,40]
y2 = [20,21,22,23]
plt.figure(figsize=(8,5))
plt.barh(x1,y1,label = "Open Tickets",color = '#FF6F00')
plt.barh(x1,y2,label = "Closed Tickets", left = y1 , color = '#FFB300')
plt.xlabel('$X$')
plt.ylabel('$Y$')

for x,y in zip(x1,y1):
    plt.text(y-10, x, '%d' % y, ha='center' , va= 'bottom')

for x,y,z in zip(x1,y2,y1):
    plt.text(y+z-10, x, '%d' % y, ha='center' , va= 'bottom')

plt.title ('$Bar $ $ Chart$')
plt.legend()
plt.show()
```




```
# Displaying values at the top of the Grouped Bar Chart using plt.text()
plt.figure(figsize=(7,9))

# set width of bar
barWidth = 0.25

# set height of bar
y1= np.array([17,18,29,40])
y2 =np.array([20,21,22,23])
y3 =np.array([5,9,11,12])

# Set position of bar on X axis
pos1 = np.arange(len(y1))
pos2 = [x + barWidth for x in pos1]
pos3 = [x + barWidth for x in pos2]

# Make the plot
plt.bar(pos1, y1, color='#FBC02D', width=barWidth, label='Open')
plt.bar(pos2, y2, color='#E57F17', width=barWidth, label='Closed')
```

```
plt.bar(pos2, y2, color='#F57F17', width=barWidth, label='Closed')
plt.bar(pos3, y3, color='#E65100', width=barWidth, label='Cancelled')

# Add xticks on the middle of the group bars
plt.xlabel('Assignee', fontweight='bold')
plt.ylabel('Number of Tickets', fontweight='bold')
plt.xticks([i + barWidth for i in range(len(y1))], ['Asif', 'Basit', 'Ravi', 'Minil'])

for x,y in zip(pos1,y1):
    plt.text(x, y, '%d' % y, ha='center' , va= 'bottom')

for x,y in zip(pos2,y2):
    plt.text(x, y, '%d' % y, ha='center' , va= 'bottom')

for x,y in zip(pos3,y3):
    plt.text(x, y, '%d' % y, ha='center' , va= 'bottom')

plt.title ('$Grouped $  $ Bar $  $ Chart$')

# Create legend & Show graphic
plt.legend()
plt.show()
```


Grouped Bar Chart
Open
Closed
Cancelled
Number of Tickets
40
35
30
25
20
15
5
0
17
20
18
21
29
22
40
23
12
5
Asif
Basit
Ravi
Minil
Assignee