- Shin’s Lab -

# Python for Data Visualization

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## -Chapter.4 Bar Plot -

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### 4-03. Rect Objects

1. Rect Object and ax.text
2. Rect Object Examples

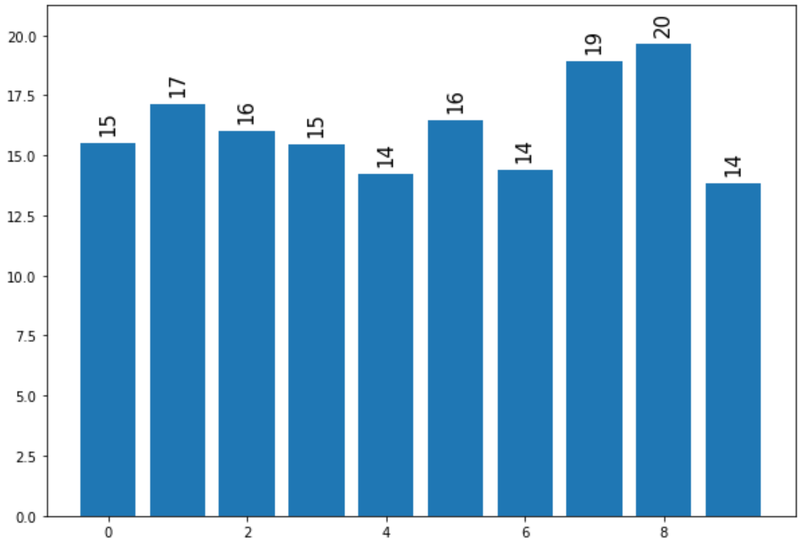
# 1. Rect Object and ax.text

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

np.random.seed(0)

n_data = 10
data = np.random.uniform(10, 20, (n_data,))
data_idx = np.arange(n_data)

fig, ax = plt.subplots(figsize=(10, 7))
rects = ax.bar(data_idx, data,
               width=1,
               facecolor='white',
               edgecolor='tab:blue')

for rect_idx, rect in enumerate(rects):
    print(rect_idx, rect)
```

```
0 Rectangle(xy=(-0.5, 0), width=1, height=15.4881, angle=0)
1 Rectangle(xy=(0.5, 0), width=1, height=17.1519, angle=0)
2 Rectangle(xy=(1.5, 0), width=1, height=16.0276, angle=0)
3 Rectangle(xy=(2.5, 0), width=1, height=15.4488, angle=0)
4 Rectangle(xy=(3.5, 0), width=1, height=14.2365, angle=0)
5 Rectangle(xy=(4.5, 0), width=1, height=16.4589, angle=0)
6 Rectangle(xy=(5.5, 0), width=1, height=14.3759, angle=0)
7 Rectangle(xy=(6.5, 0), width=1, height=18.9177, angle=0)
8 Rectangle(xy=(7.5, 0), width=1, height=19.6366, angle=0)
9 Rectangle(xy=(8.5, 0), width=1, height=13.8344, angle=0)
```

# 1. Rect Object and ax.text

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

np.random.seed(0)

n_data = 10
data = np.random.uniform(10, 20, (n_data,))
data_idx = np.arange(n_data)

fig, ax = plt.subplots(figsize=(10, 7))
rects = ax.bar(data_idx, data)

y_ticks = ax.get_yticks()
ytick_interval = y_ticks[1] - y_ticks[0]
ax.set_ylim([0, 20 + ytick_interval*0.5])

for rect_idx, rect in enumerate(rects):
    x = rect.get_x()
    width = rect.get_width()
    height = rect.get_height()

    ax.text(x + width/2, height + ytick_interval*0.2,
            str(round(data[rect_idx])),
            rotation=90,
            ha='center',
            fontsize=15)
```

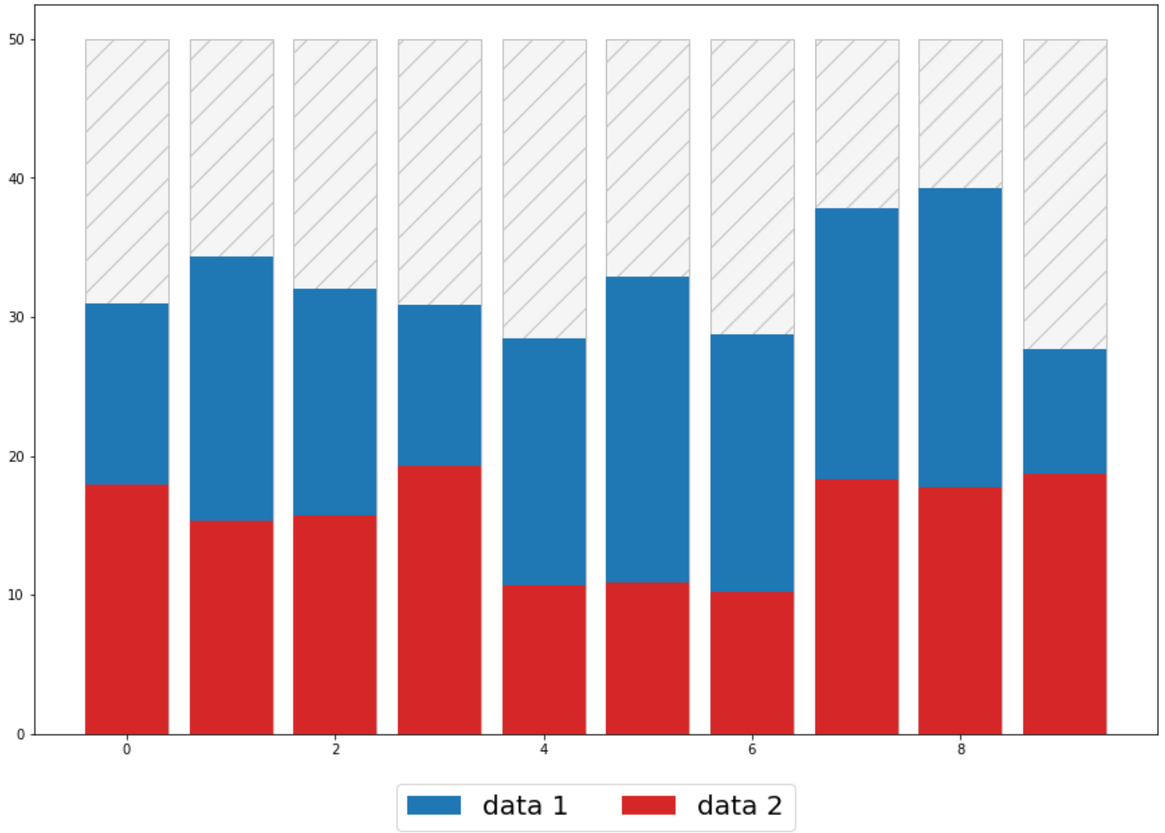


# 2. Rect Object Examples

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

np.random.seed(0)

n_data = 10
data1 = np.random.uniform(20, 40, (n_data,))
data2 = np.random.uniform(10, 20, (n_data,))
background = 50*np.ones(n_data)
data_idx = np.arange(n_data)

colors = ['tab:blue', 'tab:red']
labels = ['data 1', 'data 2']

fig, ax = plt.subplots(figsize=(15, 10))
ax.bar(data_idx, background,
       facecolor='whitesmoke',
       hatch='/',
       edgecolor='silver')
```

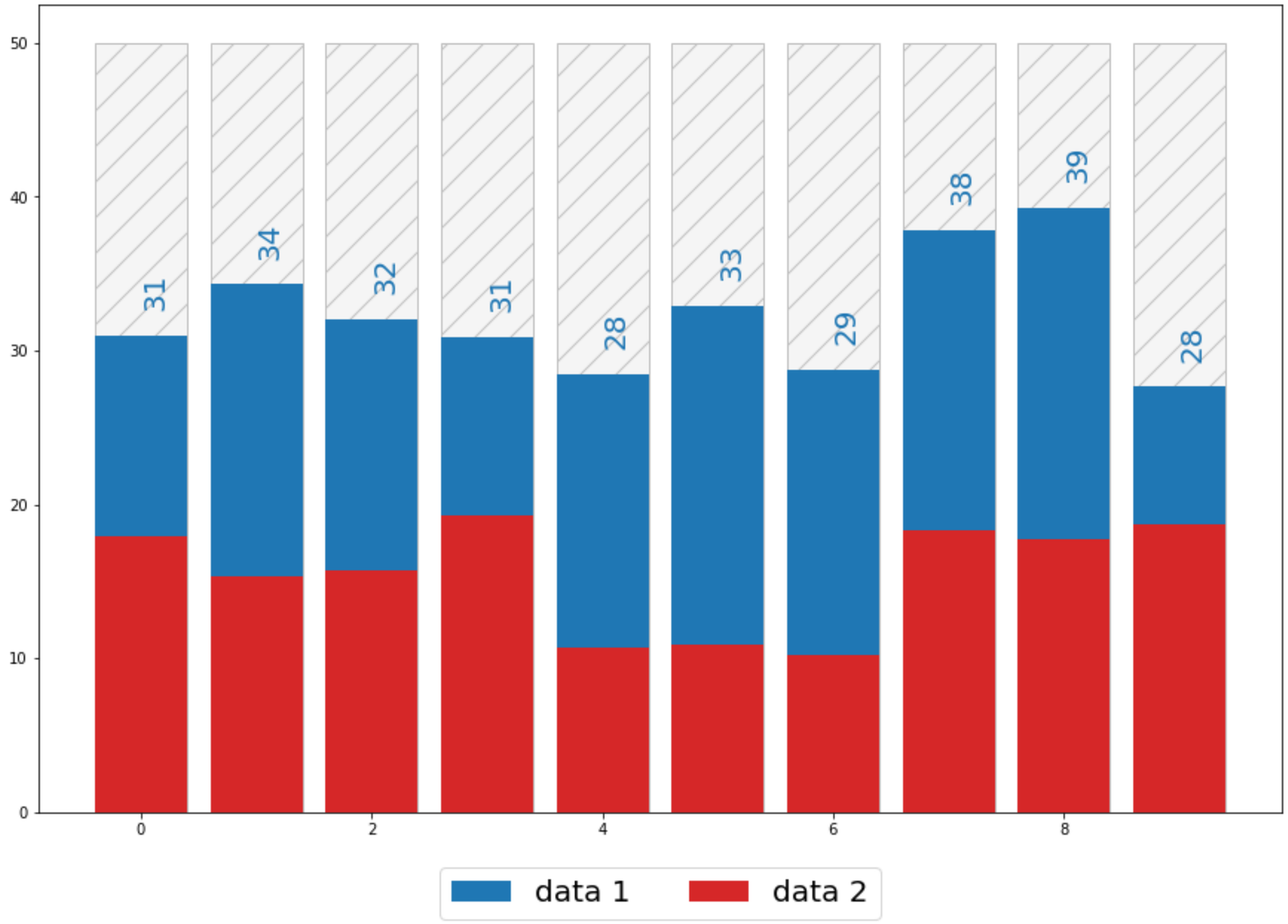
# 2. Rect Object Examples

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

np.random.seed(0)

n_data = 10
data1 = np.random.uniform(20, 40, (n_data,))
data2 = np.random.uniform(10, 20, (n_data,))
background = 50*np.ones(n_data)
data_idx = np.arange(n_data)

colors = ['tab:blue', 'tab:red']
labels = ['data 1', 'data 2']

fig, ax = plt.subplots(figsize=(15, 10))
ax.bar(data_idx, background,
       facecolor='whitesmoke',
       hatch='/',
       edgecolor='silver')

rects1 = ax.bar(data_idx, data1,
                color=colors[0],
                label=labels[0])

rects2 = ax.bar(data_idx, data2,
                color=colors[1],
                label=labels[1])

ax.legend(loc='upper center',
          bbox_to_anchor=(0.5, -0.05),
          fontsize=20,
          ncol=2)
```



# 2. Rect Object Examples

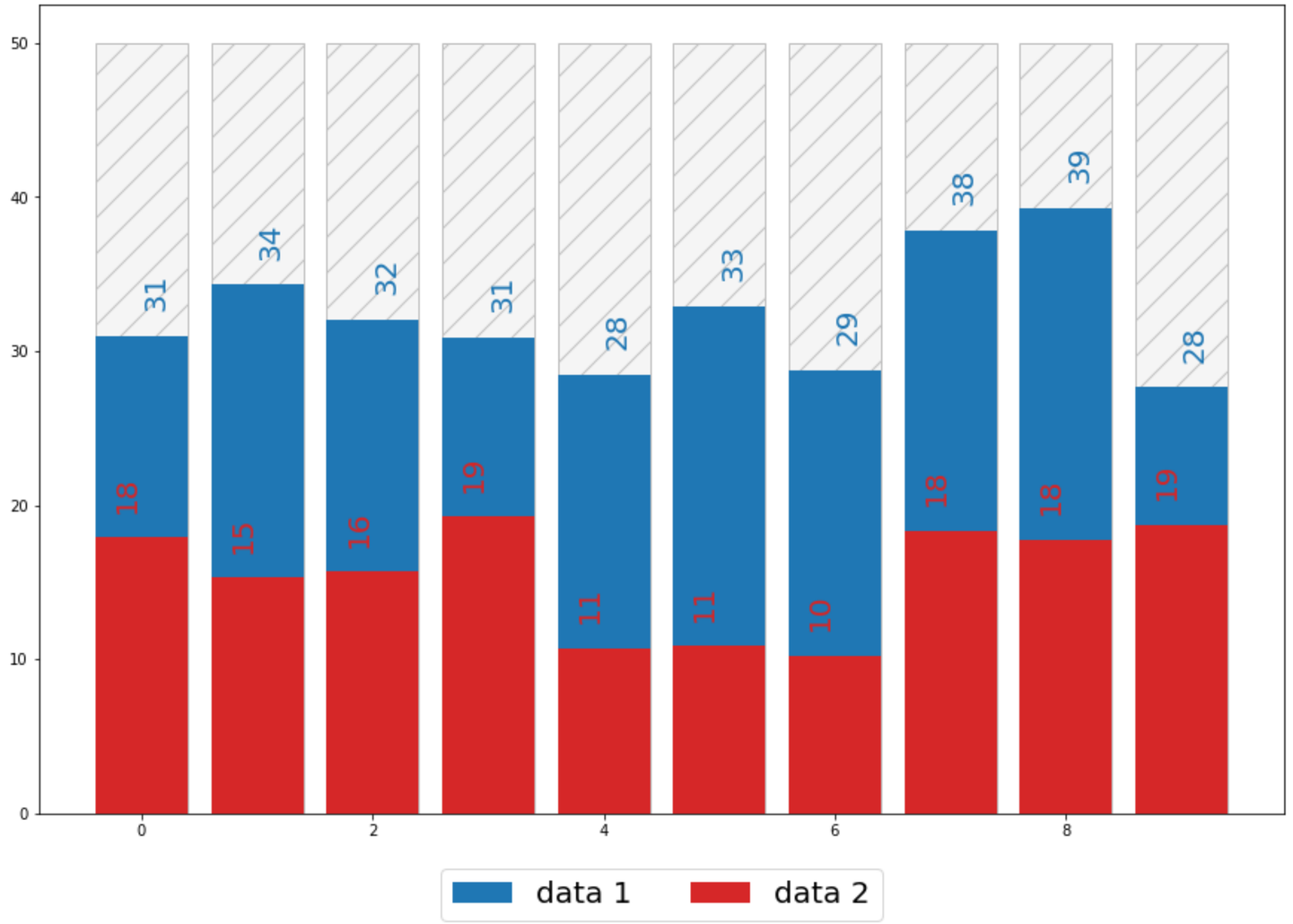
```
y_ticks = ax.get_yticks()
ytick_interval = y_ticks[1] - y_ticks[0]

for rect_idx, rect in enumerate(rects1):
    x = rect.get_x()
    width = rect.get_width()
    height = rect.get_height()

    ax.text(x + width/2,
            height + ytick_interval*0.2,
            str(round(height)),
            rotation=90,
            ha='left',
            fontsize=20,
            color=colors[0])
```



# 2. Rect Object Examples

```
y_ticks = ax.get_yticks()
ytick_interval = y_ticks[1] - y_ticks[0]

for rect_idx, rect in enumerate(rects1):
    x = rect.get_x()
    width = rect.get_width()
    height = rect.get_height()

    ax.text(x + width/2,
            height + ytick_interval*0.2,
            str(round(height)),
            rotation=90,
            ha='left',
            fontsize=20,
            color=colors[0])
```

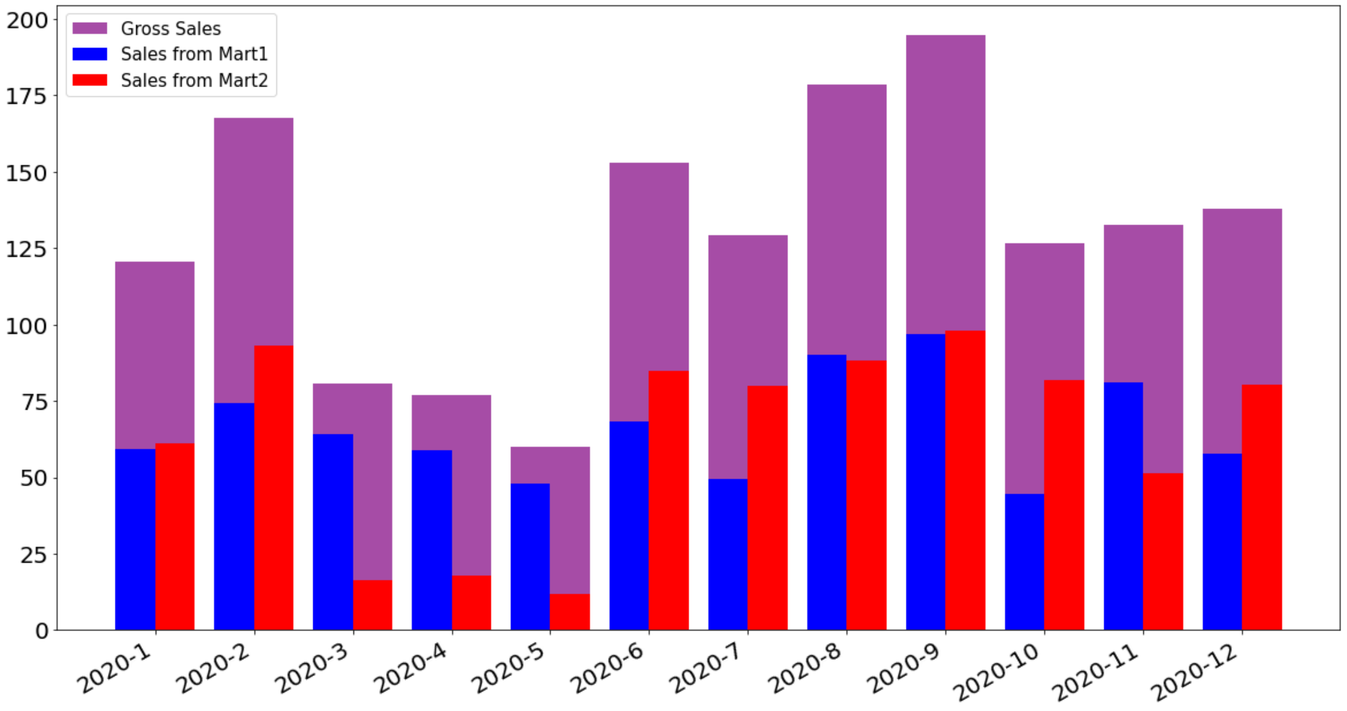
```
for rect_idx, rect in enumerate(rects2):
    x = rect.get_x()
    width = rect.get_width()
    height = rect.get_height()

    ax.text(x + width/2,
            height + ytick_interval*0.2,
            str(round(height)),
            rotation=90,
            ha='right',
            fontsize=20,
            color=colors[1])
```



# 2. Rect Object Examples

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

np.random.seed(0)

n_data = 12
data_idx = np.arange(n_data)
sales_mart1 = np.random.uniform(10, 100, (n_data,))
sales_mart2 = np.random.uniform(10, 100, (n_data,))
sales_gross = sales_mart1 + sales_mart2
label_list = ['2020-' + str(i+1) for i in range(n_data)]


WIDTH = 0.8
BAR_WIDTH = WIDTH/2

fig, ax = plt.subplots(figsize=(20, 10))
ax.bar(data_idx, sales_gross,
       label='Gross Sales',
       color='purple',
       alpha=0.7)

ax.bar(data_idx - BAR_WIDTH/2, sales_mart1,
       width=BAR_WIDTH,
       label='Sales from Mart1',
       color='blue')

ax.bar(data_idx + BAR_WIDTH/2, sales_mart2,
       width=BAR_WIDTH,
       label='Sales from Mart2',
       color='red',)
```

```
ax.set_xticks(data_idx)
ax.set_xticklabels(label_list,
                   rotation=30,
                   ha='right')
ax.tick_params(labelsize=20)
ax.legend(loc='upper left',
          fontsize=15)
```



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