

mmxdmtdqh

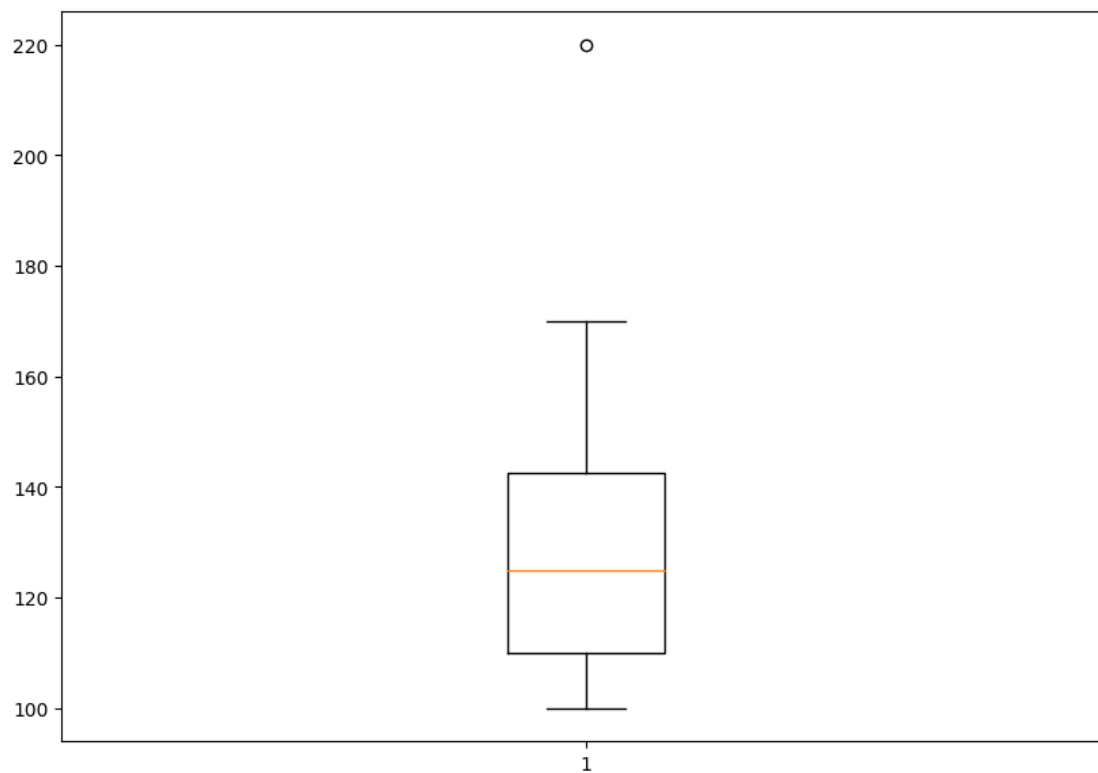
April 29, 2024

```
[ ]: print("w")
```

w

```
[2]: import matplotlib.pyplot as plt  
import numpy as np
```

```
[4]: np.random.seed(10)  
data = [100,110,110,110,120,120,130,140,140,150,170,220]  
fig = plt.figure(figsize =(10, 7))  
plt.boxplot(data)  
plt.show()
```



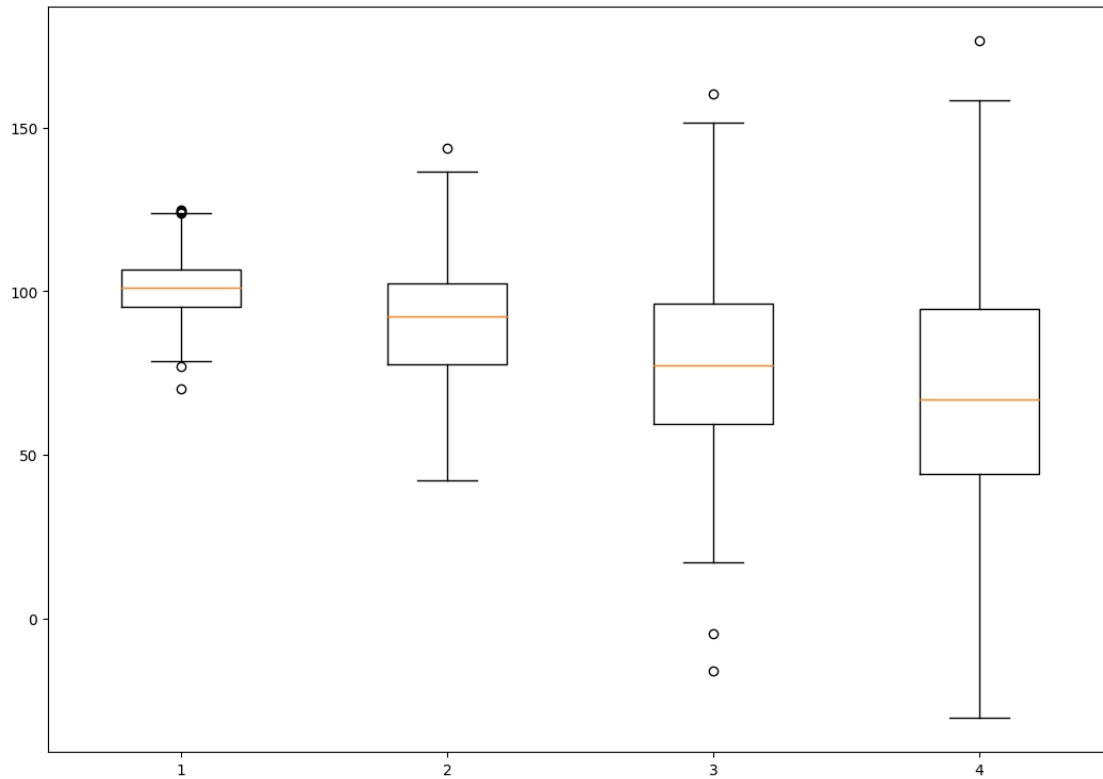
```
[ ]:
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```
[ ]: np.random.seed(10)

data_1 = np.random.normal(100, 10, 200)
data_2 = np.random.normal(90, 20, 200)
data_3 = np.random.normal(80, 30, 200)
data_4 = np.random.normal(70, 40, 200)
data = [data_1, data_2, data_3, data_4]

fig = plt.figure(figsize=(10, 7))
#Creating axes instance
ax = fig.add_axes([0, 0, 1, 1])
bp = ax.boxplot(data)

plt.show()
```



```
[ ]: import matplotlib.pyplot as plt
import numpy as np
np.random.seed(10)
data_1 = np.random.normal(100, 10, 200)
data_2 = np.random.normal(90, 20, 200)
```

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data_3 = np.random.normal(80, 30, 200)
data = [data_1, data_2, data_3, data_4]

fig = plt.figure(figsize=(10, 7))
ax = fig.add_subplot(111)

# Creating axes instance
bp = ax.boxplot(data, vert = True)

colors = ['#0000FF', '#00FF00', '#FFFF00', '#FF00FF']

q1 = np.percentile(data, 25, axis=1)
q2 = np.percentile(data, 50, axis=1)
q3 = np.percentile(data, 75, axis=1)

for i, label in enumerate(['1', '2', '3', '4']):
    print(f"{label} Quartiles (Q1, Q2, Q3): {q1[i]}, {q2[i]}, {q3[i]}")
ax.set_xticklabels(['data_1', 'data_2', 'data_3', 'data_4'])

plt.title("Customized box plot")
ax.get_xaxis().tick_bottom()
ax.get_yaxis().tick_left()

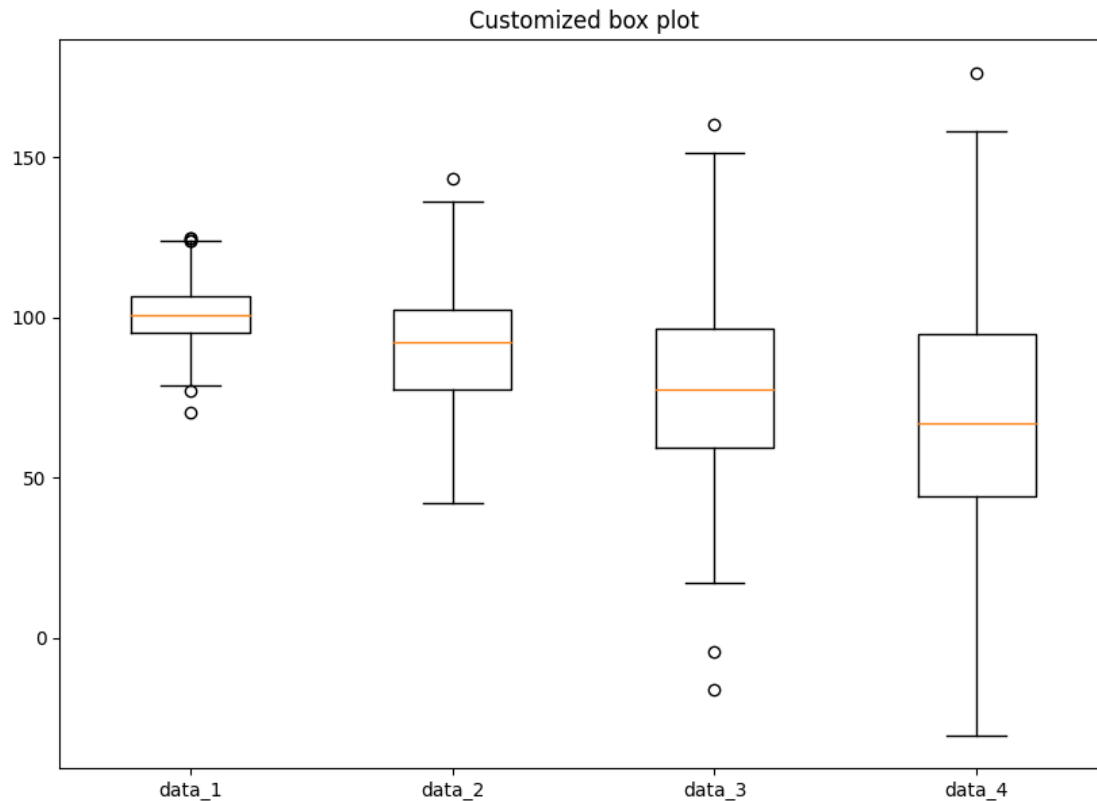
plt.show()

```

```

1 Quartiles (Q1, Q2, Q3): 95.16095841652228, 100.9436841421238,
106.63752911001835
2 Quartiles (Q1, Q2, Q3): 77.66733226354788, 92.38949579666813,
102.38550637348374
3 Quartiles (Q1, Q2, Q3): 59.442088569850384, 77.48104385416886,
96.31617291667169
4 Quartiles (Q1, Q2, Q3): 44.25241763895761, 66.81828864067066,
94.67516057539692

```



```
[ ]: import matplotlib.pyplot as plt
import numpy as np
np.random.seed(10)
data_1 = np.random.normal(100, 10, 200)
data_2 = np.random.normal(90, 20, 200)
data_3 = np.random.normal(80, 30, 200)
data_4 = np.random.normal(70, 40, 200)
data = [data_1, data_2, data_3, data_4]

fig = plt.figure(figsize=(10, 7))
ax = fig.add_subplot(111)

# Creating axes instance with vert set to True for vertical boxplot
bp = ax.boxplot(data, patch_artist=True,
                notch=True, vert=True)

colors = ['#0000FF', '#00FF00',
          '#FFFF00', '#FF00FF']

for patch, color in zip(bp['boxes'], colors):
    patch.set_facecolor(color)
```

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# changing color and linewidth of whiskers
for whisker in bp['whiskers']:
    whisker.set(color='#8B008B',
                 linewidth=1.5,
                 linestyle=":")

# changing color and linewidth of caps
for cap in bp['caps']:
    cap.set(color='#8B008B',
            linewidth=2)

# changing color and linewidth of medians
for median in bp['medians']:
    median.set(color='red',
               linewidth=3)

# changing style of fliers
for flier in bp['fliers']:
    flier.set(marker='D',
              color='#e7298a',
              alpha=0.5)

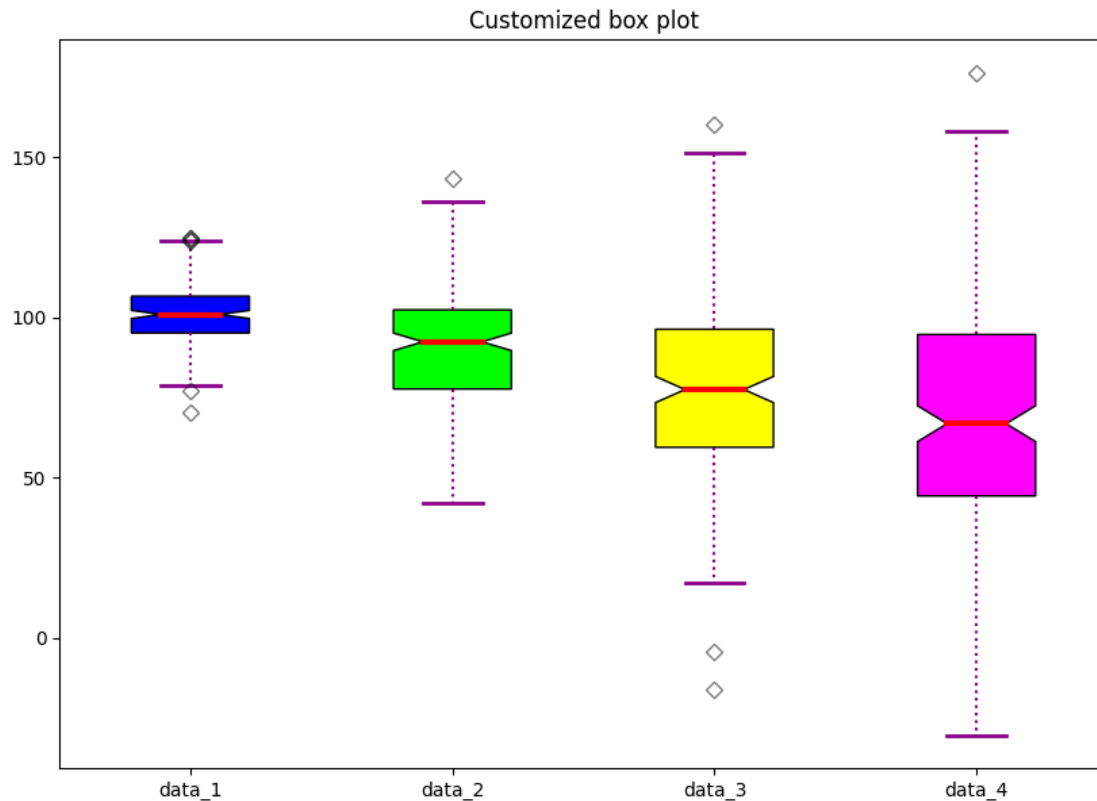
# y-axis labels since we have switched to vertical boxplot
ax.set_xticklabels(['data_1', 'data_2', 'data_3', 'data_4'])

# Adding title
plt.title("Customized box plot")

# Removing top axes and right axes ticks
ax.get_xaxis().tick_bottom()
ax.get_yaxis().tick_left()

# show plot
plt.show()

```



```
[ ]:
```

```
[ ]: # Import libraries
import matplotlib.pyplot as plt
import numpy as np

# Creating dataset
np.random.seed(10)
data_1 = np.random.normal(100, 10, 200)
data_2 = np.random.normal(90, 20, 200)
data_3 = np.random.normal(80, 30, 200)
data_4 = np.random.normal(70, 40, 200)
data = [data_1, data_2, data_3, data_4]

fig = plt.figure(figsize=(10, 7))
ax = fig.add_subplot(111)

# Creating axes instance with vert set to True for vertical boxplot
bp = ax.boxplot(data, patch_artist=True, notch=True, vert=True)

colors = ['#0000FF', '#00FF00', '#FFFF00', '#FF00FF']
```

```

for patch, color in zip(bp['boxes'], colors):
    patch.set_facecolor(color)

# changing color and linewidth of whiskers
for whisker in bp['whiskers']:
    whisker.set(color='#8B008B', linewidth=1.5, linestyle=":")

# changing color and linewidth of caps
for cap in bp['caps']:
    cap.set(color='#8B008B', linewidth=2)

# changing color and linewidth of medians
for median in bp['medians']:
    median.set(color='red', linewidth=3)

# changing style of fliers
for flier in bp['fliers']:
    flier.set(marker='D', color='#e7298a', alpha=0.5)

# Calculate quartiles
q1 = np.percentile(data, 25, axis=1)
q2 = np.percentile(data, 50, axis=1)
q3 = np.percentile(data, 75, axis=1)

# Print quartile values
for i, label in enumerate(['1', '2', '3', '4']):
    print(f"{label} Quartiles (Q1, Q2, Q3): {q1[i]}, {q2[i]}, {q3[i]}")

# y-axis labels since we have switched to vertical boxplot
ax.set_xticklabels(['data_1', 'data_2', 'data_3', 'data_4'])

# Adding title
plt.title("Customized box plot")

# Removing top axes and right axes ticks
ax.get_xaxis().tick_bottom()
ax.get_yaxis().tick_left()

# show plot
plt.show()

```

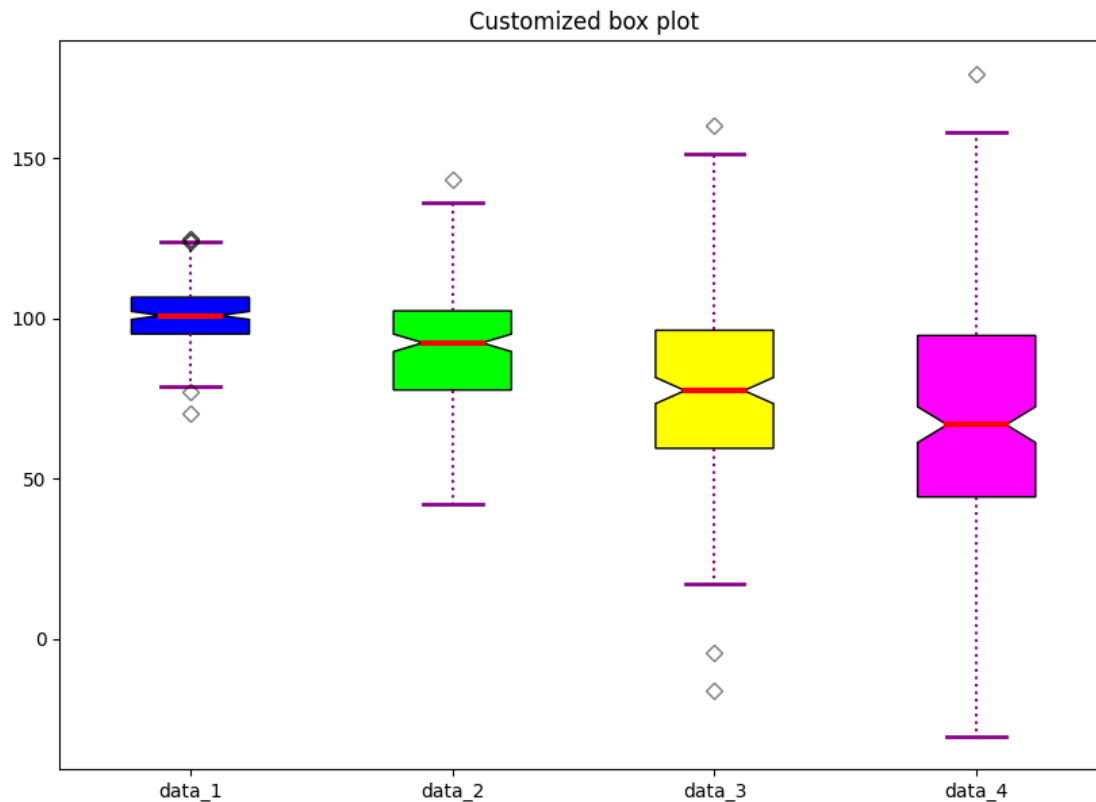
```

1 Quartiles (Q1, Q2, Q3): 95.16095841652228, 100.9436841421238,
106.63752911001835
2 Quartiles (Q1, Q2, Q3): 77.66733226354788, 92.38949579666813,
102.38550637348374
3 Quartiles (Q1, Q2, Q3): 59.442088569850384, 77.48104385416886,

```

96.31617291667169

4 Quartiles (Q1, Q2, Q3): 44.25241763895761, 66.81828864067066,  
94.67516057539692



```
[ ]: import matplotlib.pyplot as plt
import numpy as np

np.random.seed(10)
data_1 = np.random.normal(100, 10, 200)
data_2 = np.random.normal(90, 20, 200)
data_3 = np.random.normal(80, 30, 200)
data_4 = np.random.normal(70, 40, 200) # Added missing data_4
data = [data_1, data_2, data_3, data_4]
fig = plt.figure(figsize=(10, 7))
ax = fig.add_subplot(111)
bp = ax.boxplot(data, vert=True)
colors = ['#0000FF', '#00FF00', '#FFFF00', '#FF00FF']
def calculate_quartiles(data):
    data_sorted = np.sort(data)
    n = len(data_sorted)
    q1_index = int(np.ceil(0.25 * (n + 1))) - 1
    q2_index = int(np.ceil(0.50 * (n + 1))) - 1
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q3_index = int(np.ceil(0.75 * (n + 1))) - 1
q1 = data_sorted[q1_index]
q2 = data_sorted[q2_index]
q3 = data_sorted[q3_index]
return q1, q2, q3

q1_values, q2_values, q3_values = zip(*[calculate_quartiles(data_i) for data_i
    in data])

for i, label in enumerate(['1', '2', '3', '4']):
    print(f"{label} Quartiles (Q1, Q2, Q3): {q1_values[i]}, {q2_values[i]},
    {q3_values[i]}")

ax.set_xticklabels(['data_1', 'data_2', 'data_3', 'data_4'])

plt.title("Customized box plot")
ax.get_xaxis().tick_bottom()
ax.get_yaxis().tick_left()
plt.show()

```

```

1 Quartiles (Q1, Q2, Q3): 95.1790686116452, 100.99149215835244,
106.67889608833443
2 Quartiles (Q1, Q2, Q3): 77.71390307324927, 92.66274993742115,
102.40509003026938
3 Quartiles (Q1, Q2, Q3): 59.506327967712835, 77.75153395604039,
96.3735339586225
4 Quartiles (Q1, Q2, Q3): 44.366708299172075, 66.93579973122641,
95.02327768192302

```

