

DT/NT : NT

LESSON : DATA VISUALIZATION

SUBJECT: MATPLOTLIB & SEBORN

BATCH: B168
07.09.2023



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EĞİTİM PROGRAMI

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- Data Visualization Intro
- Matplotlib
- Seaborn
- Plotly
- Visualization project



KURSUN KAPSAMI

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matplotlib

```
import matplotlib.pyplot as plt
```

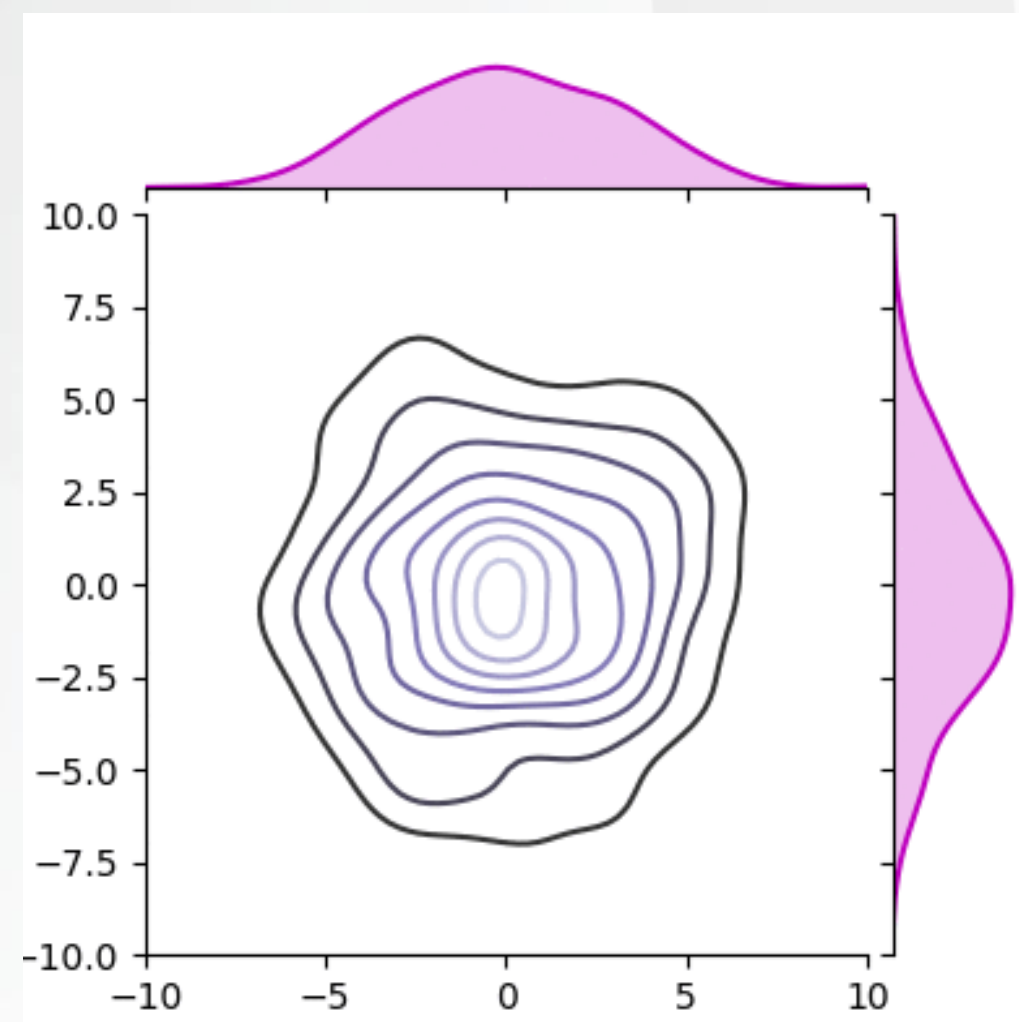
Create figure, axes, subplots



seaborn

```
import seaborn as sns
```

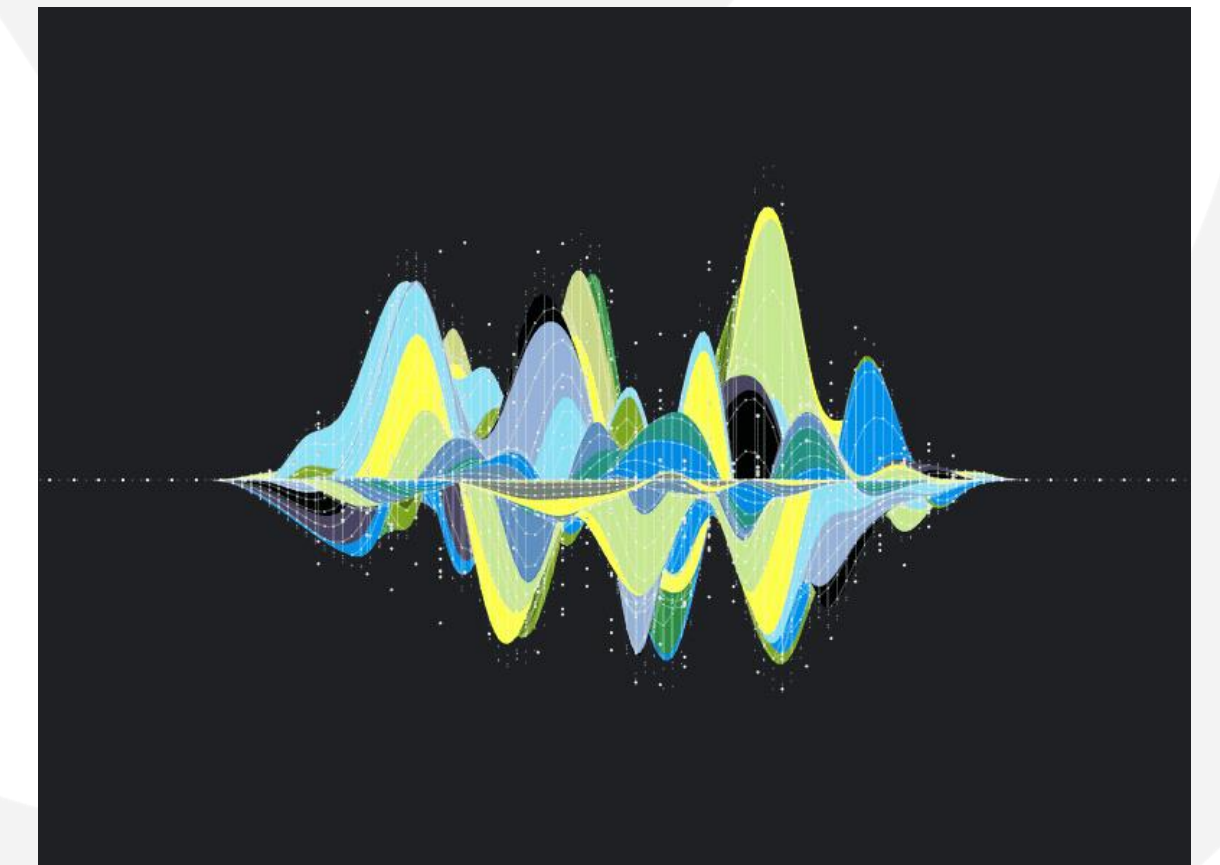
Built on matplotlib and can be used together with it



plotly

```
import plotly as py
```

No need to import matplotlib or seaborn

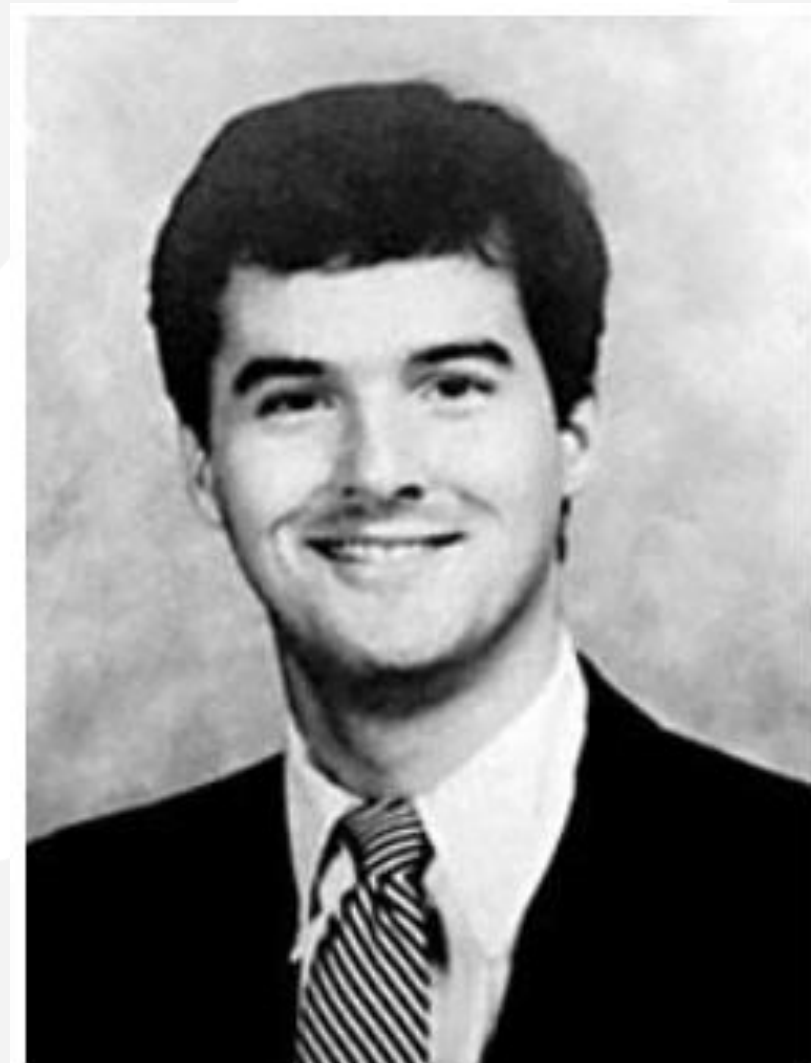




MATPLOTLIB & SEABORN

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- Python'da veriyi görselleştirmek için kullanılır.
- 2002 yılında John Hunter tarafından matlap tarzında bir arayüz oluşturmak amacıyla bir proje olarak başlatıldı.
- İlk sürümü 2003 yılında yayınlandı.
- Geliştirilerek seaborn kütüphanesi ortaya çıkmıştır.





MATPLOTLIB & SEABORN

FEATURES	MATPLOTLIB	SEABORN
Functionality	<p>It is utilized for making basic graphs. Datasets are visualised with graphs styles.</p> <ul style="list-style-type: none">• Bar graphs,• Histograms,• Pie charts,• Scatter plots,• Lines <p>and so on.</p>	<p>Seaborn contains a number of patterns and plots for data visualization. It uses fascinating themes. It helps in compiling whole data into a single plot.</p>
Syntax	<p>It uses comparatively complex and lengthy syntax.</p>	<p>It uses comparatively simple syntax which is easier to learn and understand.</p>

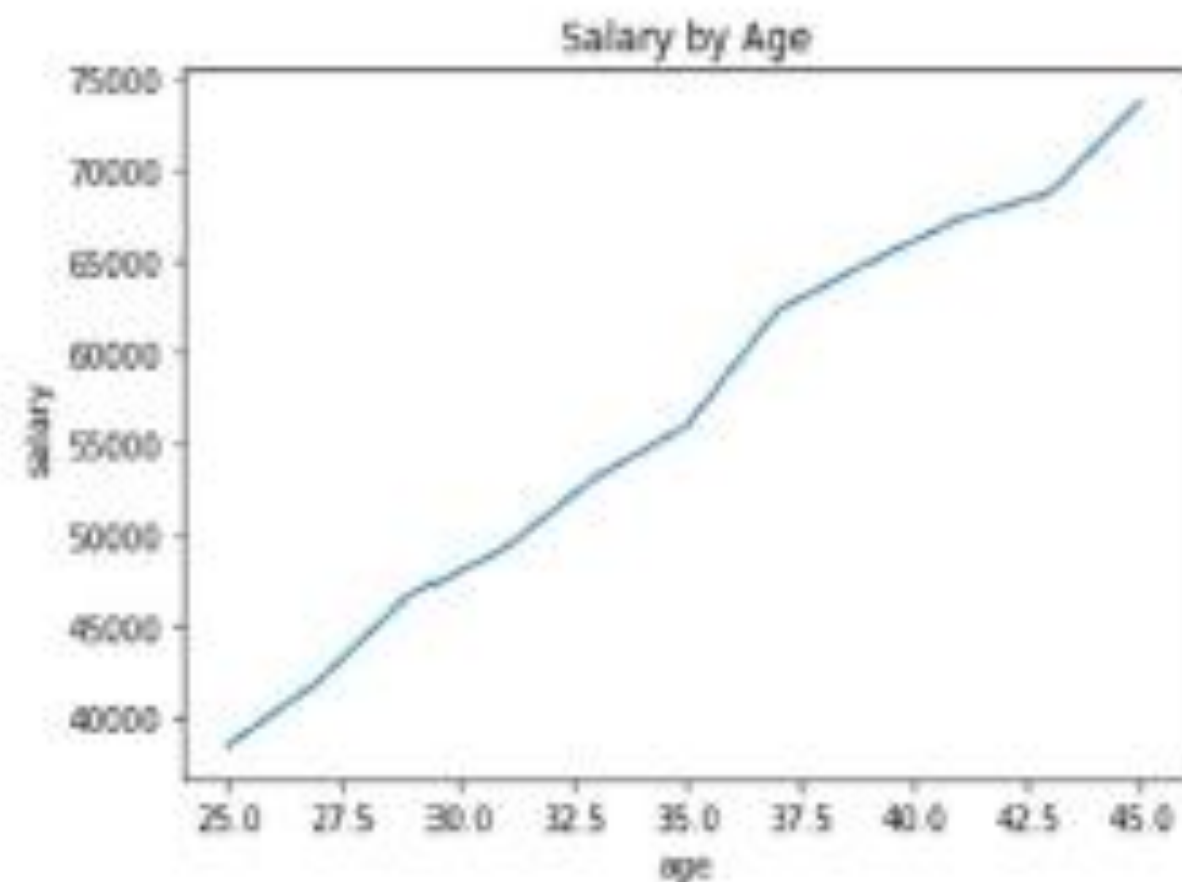


TWO METHODS

Functional Method

```
plt.plot(age, salary)
plt.xlabel("age")
plt.ylabel("salary")
plt.title("Salary by Age")

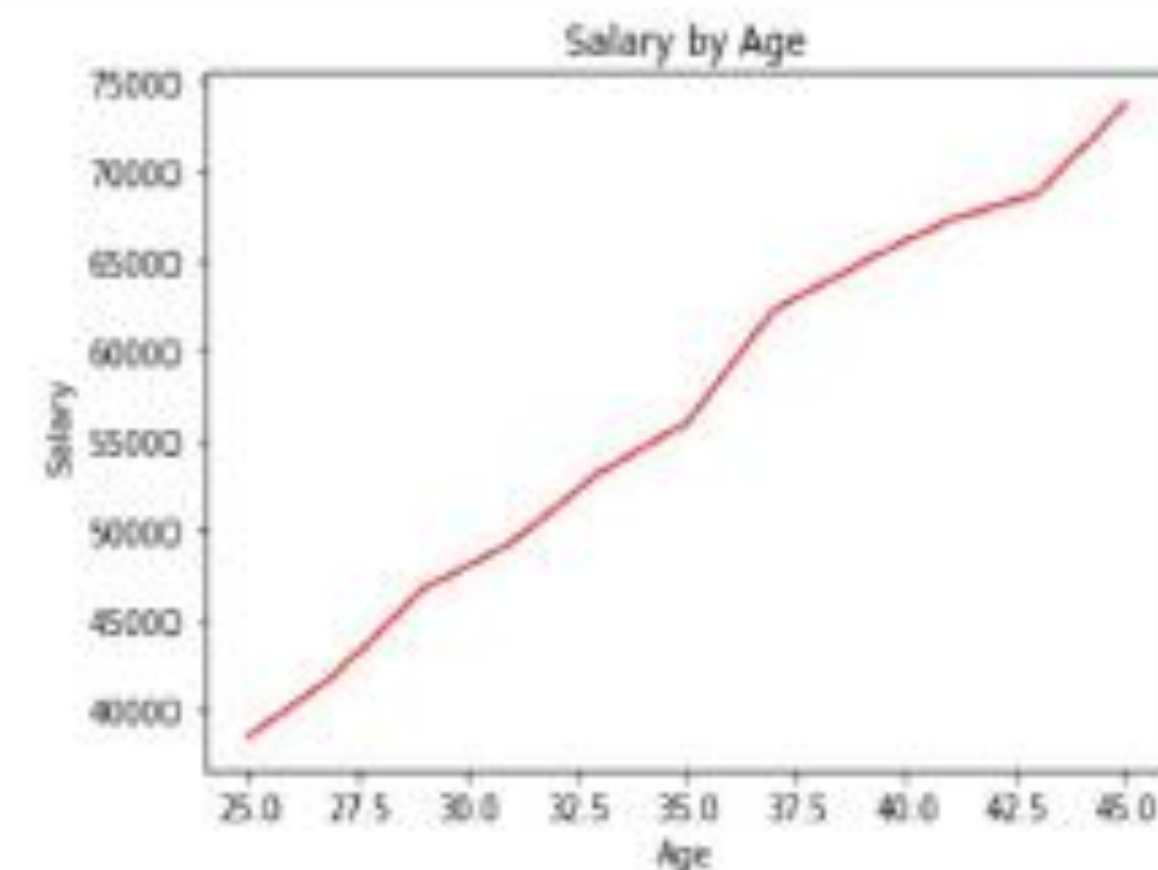
plt.show()
```



Object Oriented

```
fig, ax = plt.subplots()

ax.plot(age, salary, "r")
ax.set_xlabel("Age")
ax.set_ylabel("Salary")
ax.set_title("Salary by Age")
```





AXIS – AXES – FIGURE ?

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Figure, Axes, Axis nasıl
anlaşılmalıdır?

matplotlib

```
fig, ax = plt.subplots()  
ax = plt.subplot()  
ax = plt.axes([l,b,w,h])
```

```
fig = plt.figure()
```

```
ax = fig.add_subplot()  
ax = fig.subplots()  
ax = fig.add_axes([l,b,w,h])
```

left

width

height

bottom

axes

figure





SCATTER

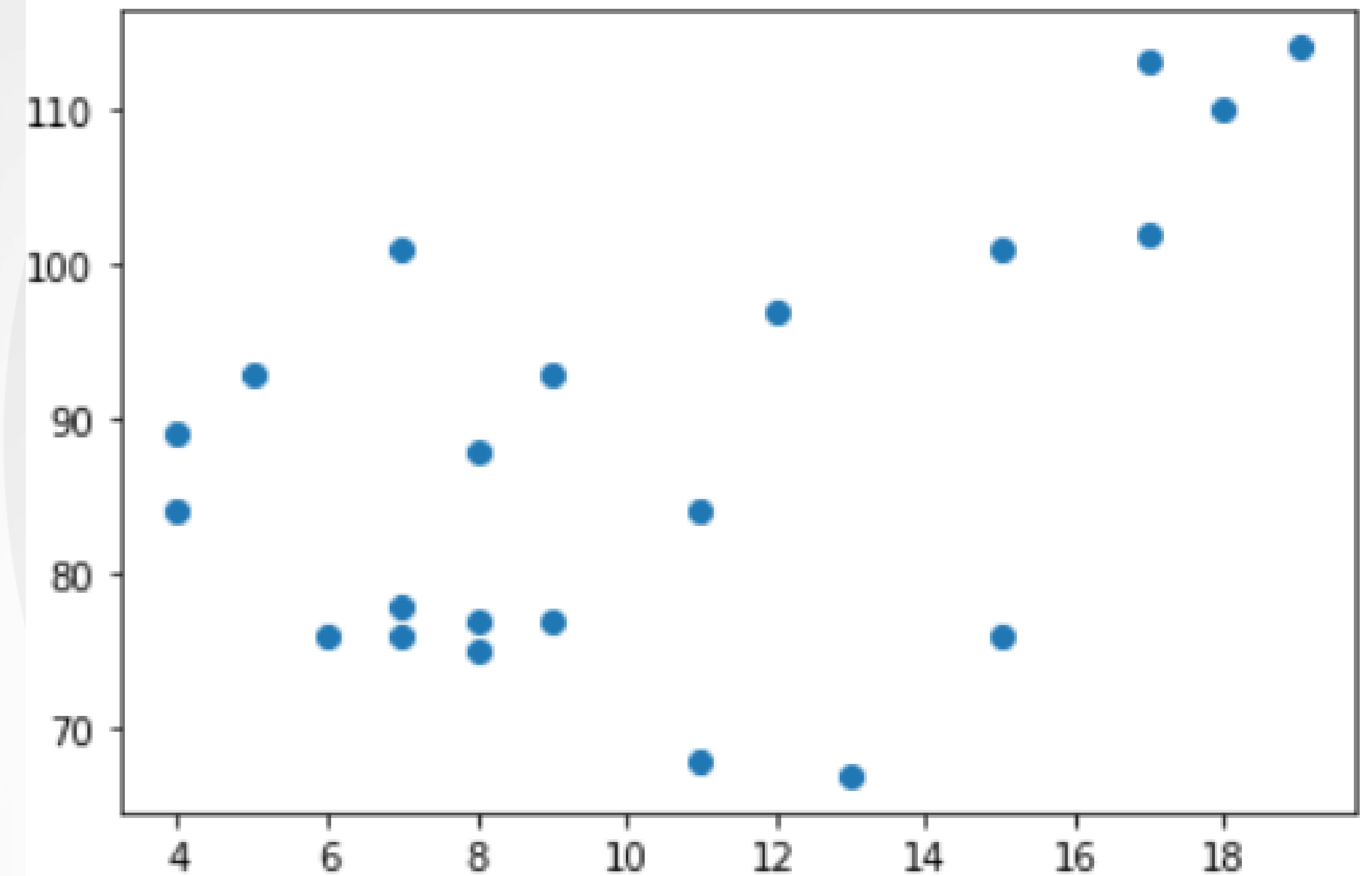
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- Data seti oluşturma

```
1 x = np.array([4, 6, 8, 7, 7, 15, 5 ,9 ,4,  
2             11, 13, 8, 7, 8, 11, 9, 12,  
3             15 ,17 ,17 ,19, 18 ])  
4  
5 y = np.array([89, 76, 77, 78, 101, 76, 93,  
6             77 ,84 ,68, 67, 75, 76, 88,  
7             84, 93, 97, 101 ,102 ,113 ,114, 110 ])
```

- Grafik oluşturma

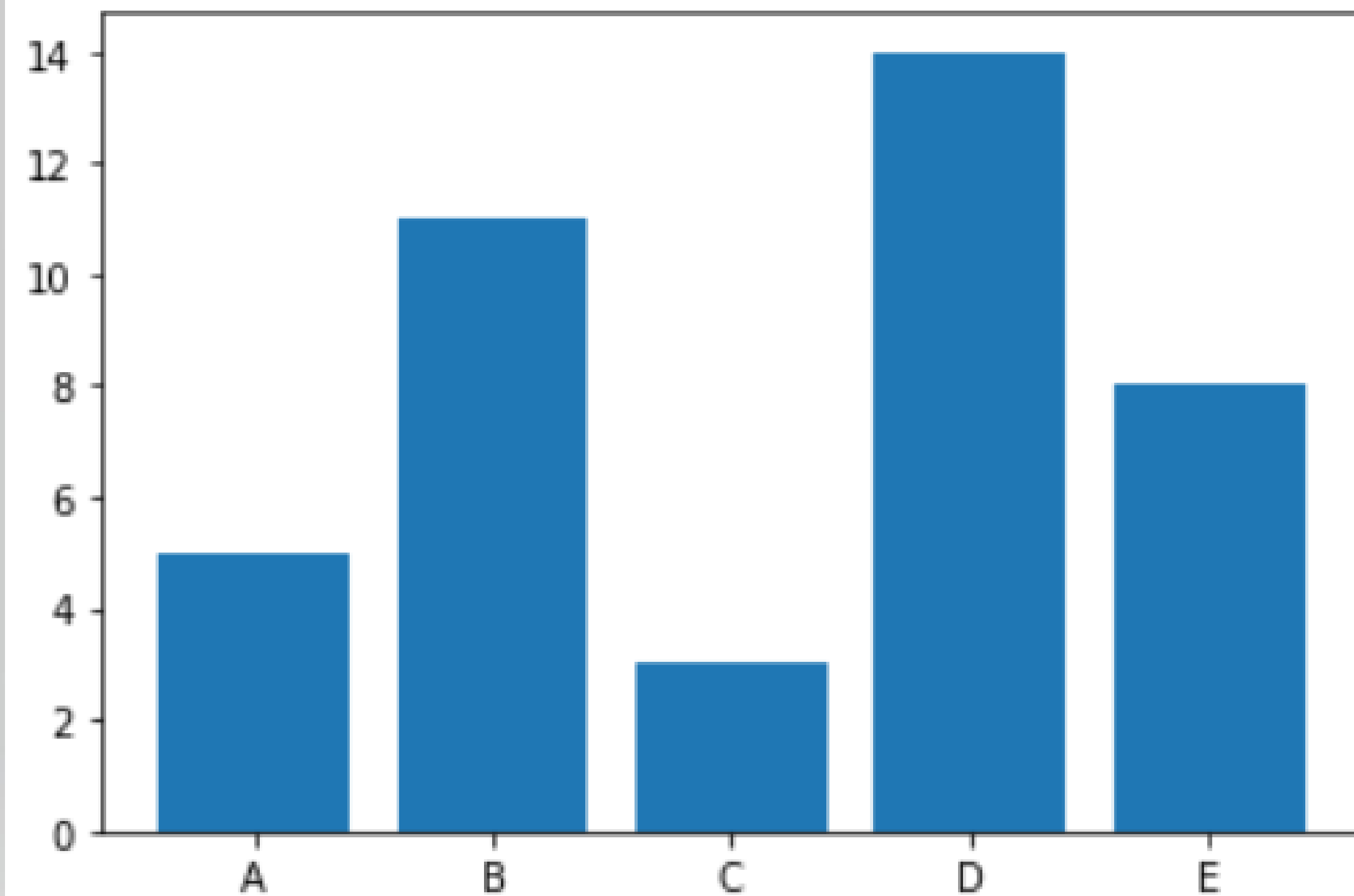
```
1 plt.scatter(x, y)  
2 plt.show()
```





BAR

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- Data seti oluşturma

```
1 x = np.array(["A", "B", "C", "D", "E"])
2 y = np.array([5, 11, 3, 14, 8])
```

- Grafik oluşturma

```
1 plt.bar(x, y)
2 plt.show()
```



HISTOGRAM

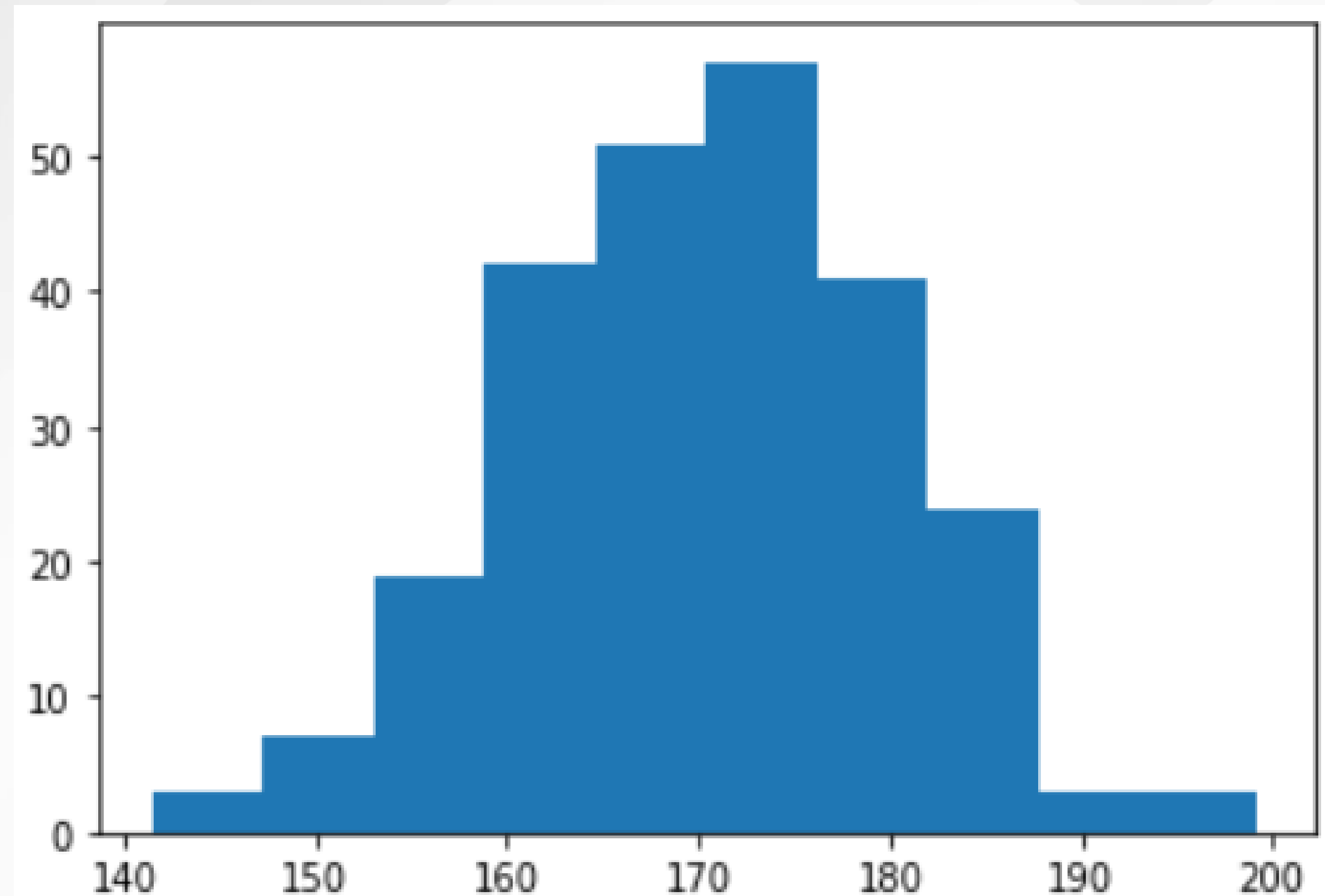
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- Data seti oluşturma

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

- Grafik oluşturma

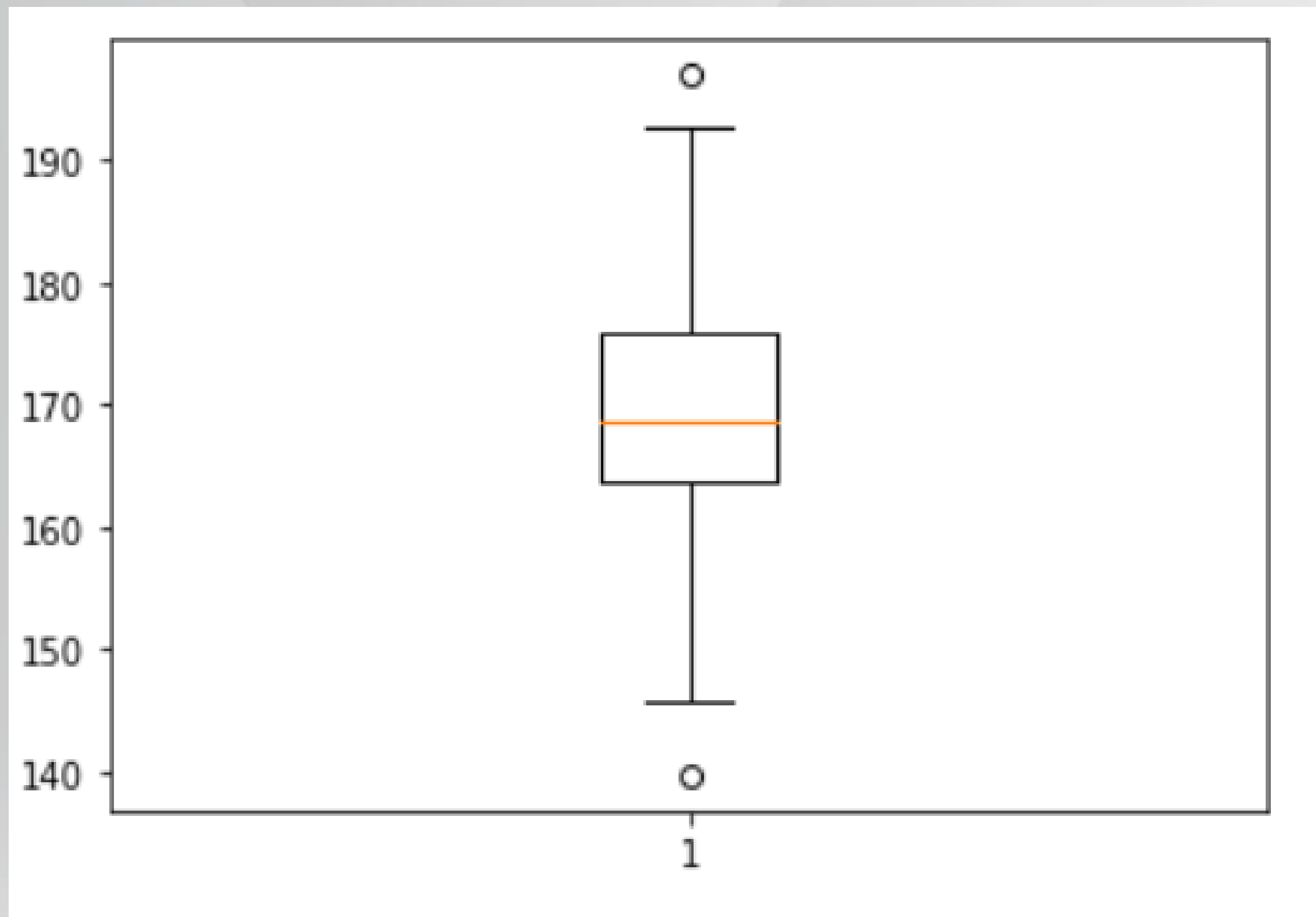
```
1 plt.hist(x)  
2 plt.show()
```





BOX PLOT

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- Data seti oluşturma

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

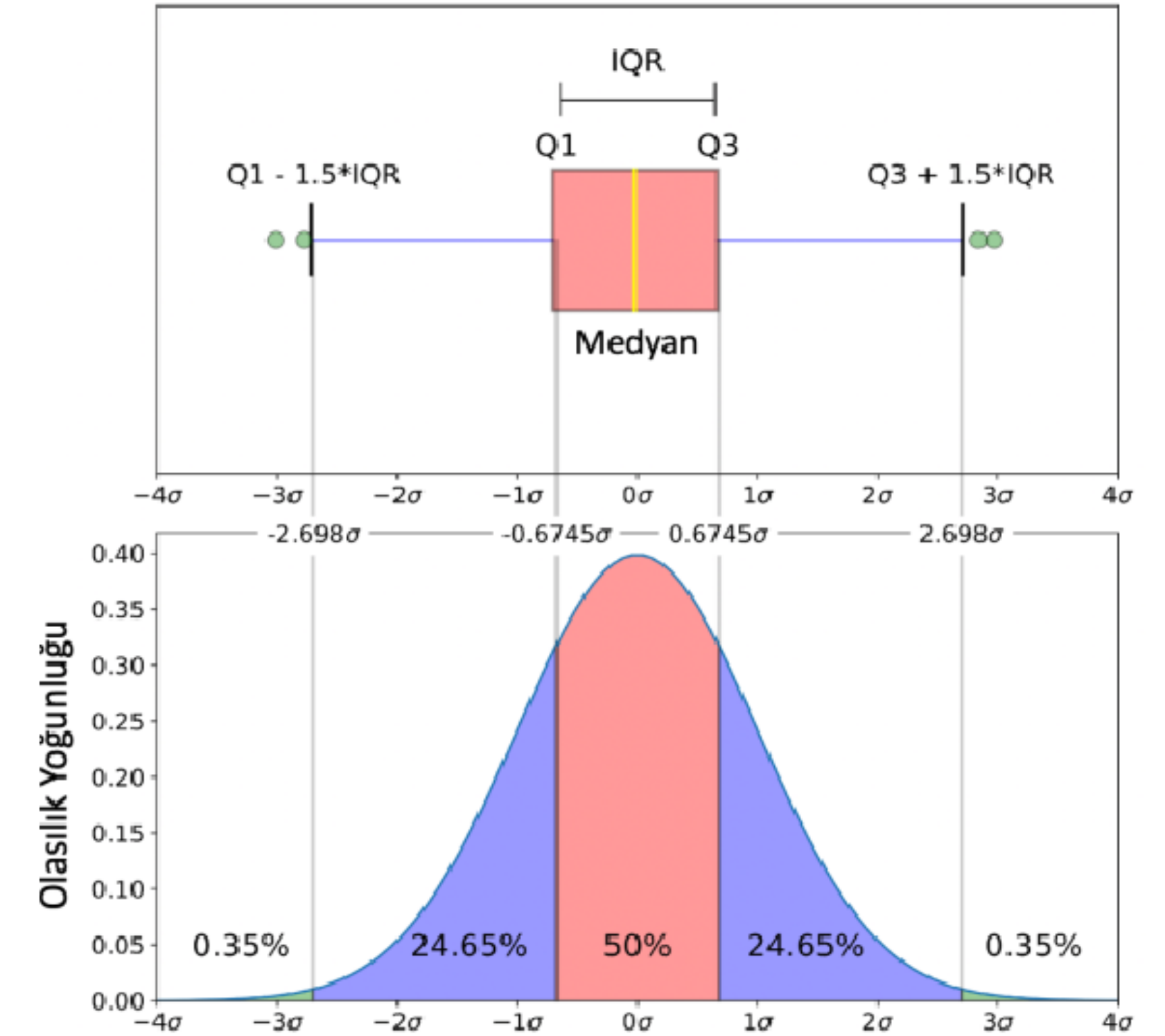
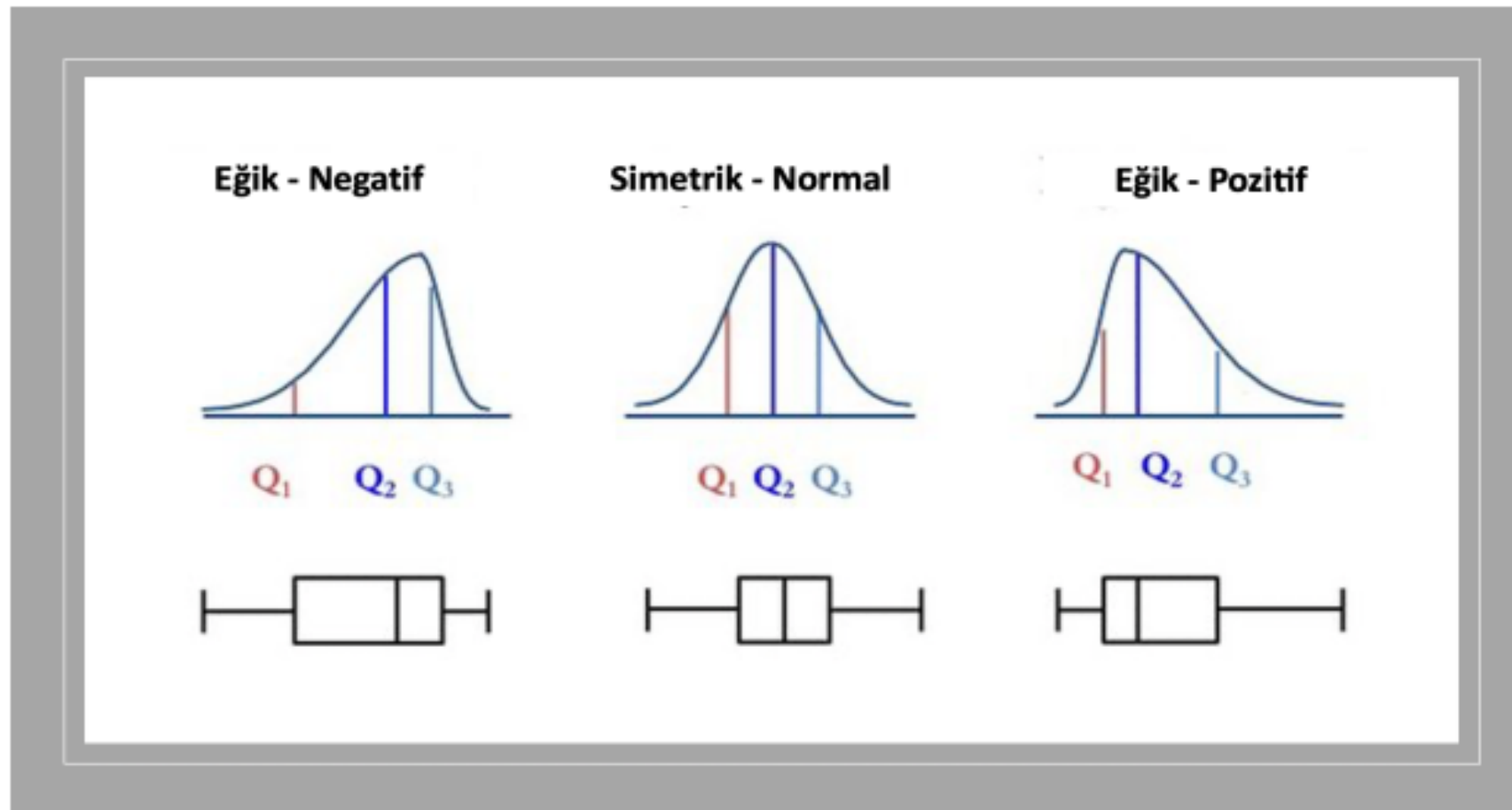
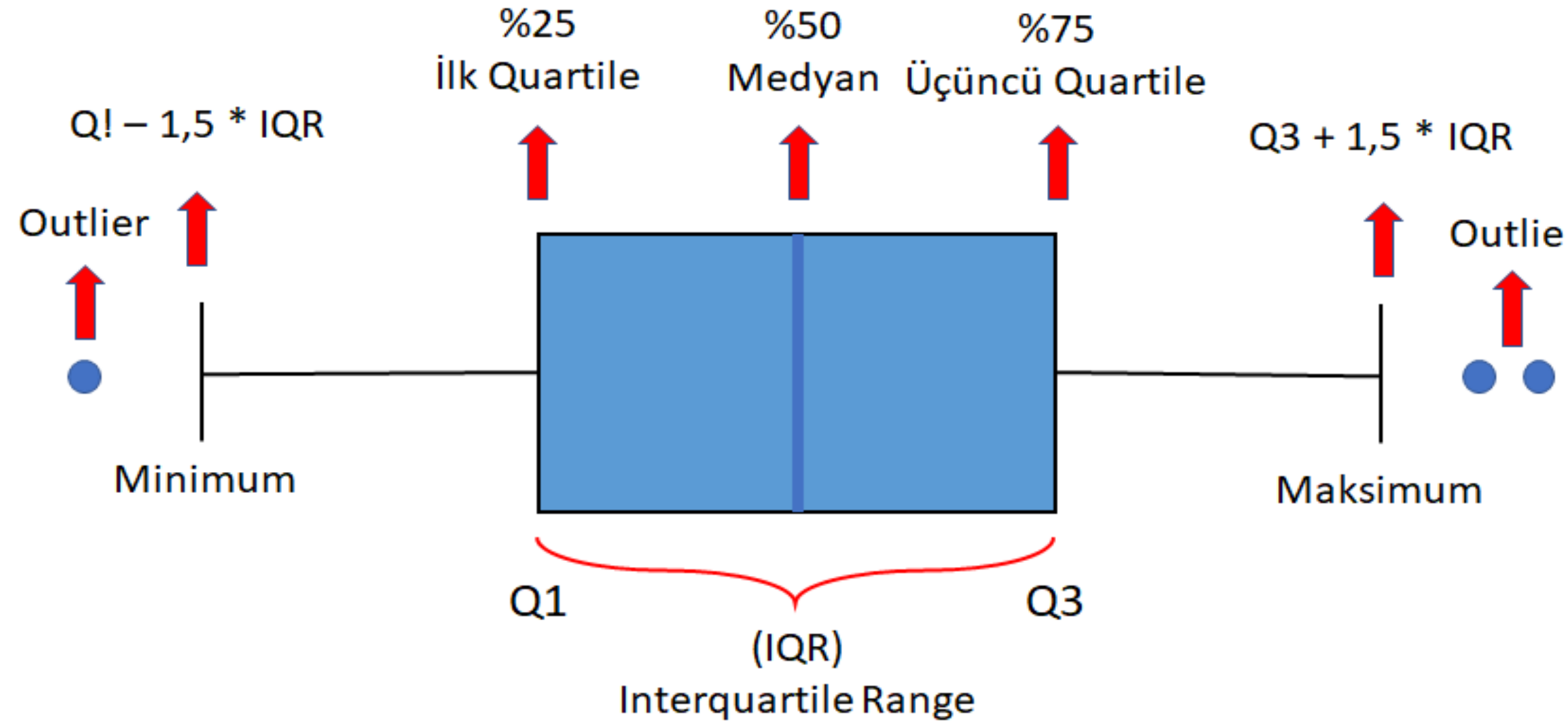
- Grafik oluşturma

```
1 plt.boxplot(x)  
2 plt.show()
```



BOX PLOT

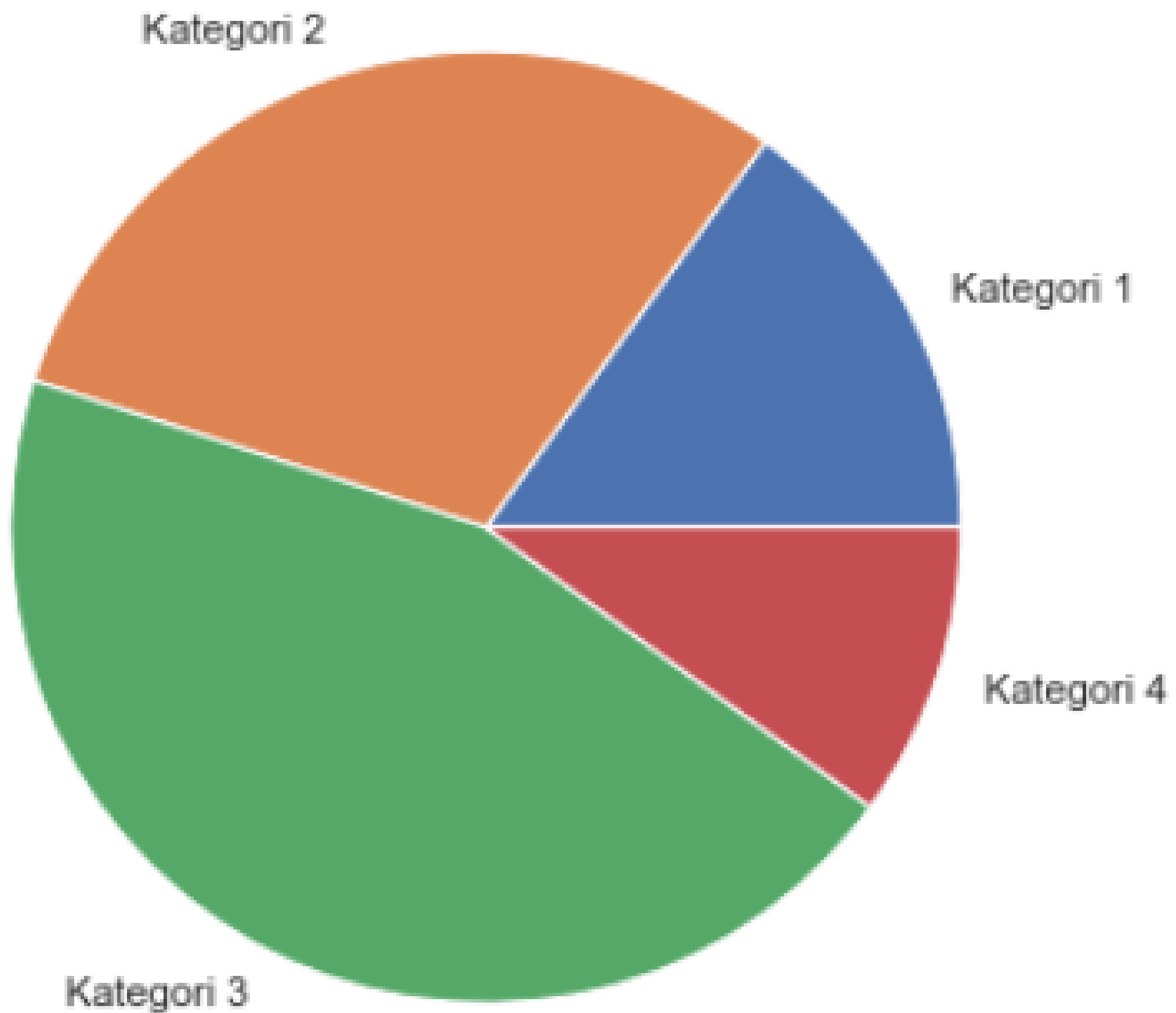
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PIE CHART

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- Data seti oluşturma

```
1 x = ['Kategori 1', 'Kategori 2', 'Kategori 3', 'Kategori 4']
```

- Grafik oluşturma

```
1 import matplotlib.pyplot as plt
2
3 # Veri
4 sizes = [15, 30, 45, 10]
5
6 # Pasta grafiğini oluştur
7 plt.figure(figsize=(6, 6))
8 plt.pie(sizes, labels=x)
9
10 # Göster
11 plt.show()
```



SEABORN PLOT TYPES

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Distributions Plots (Dağılım Grafikleri)

- displot
- histplot
- kdeplot
- rugplot

Categorical Plots (Kategorik Grafikler)

- barplot
- countplot
- boxplot
- swarmplot
- violinplot

Comparison Plots (Karşılaştırma Grafikleri)

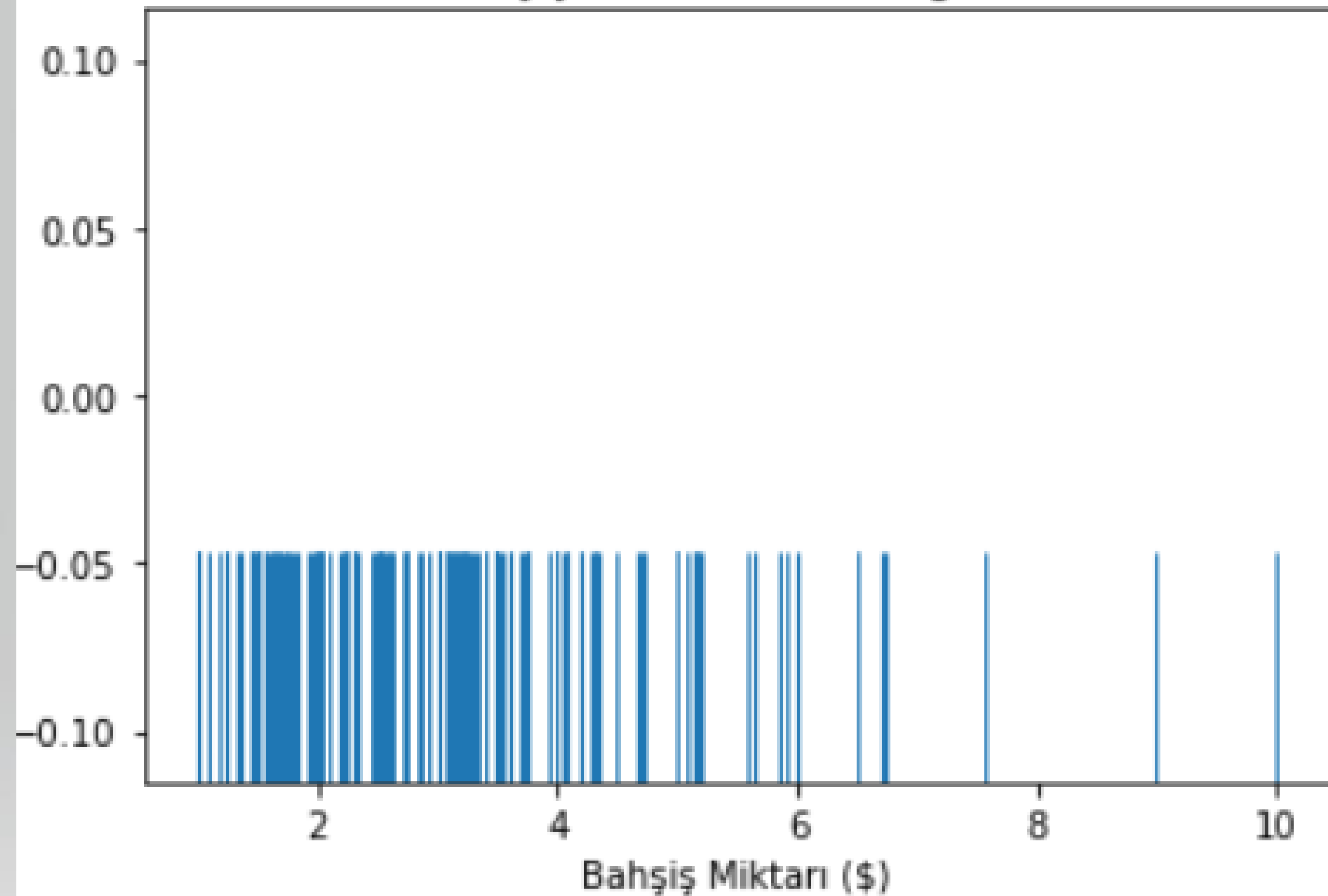
- jointplot
- pairplot
- catplot
- matrixplot
- gridplot



DISTRUBITION PLOT – RUG PLOT

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Bahşış Miktarlarının Dağılımı



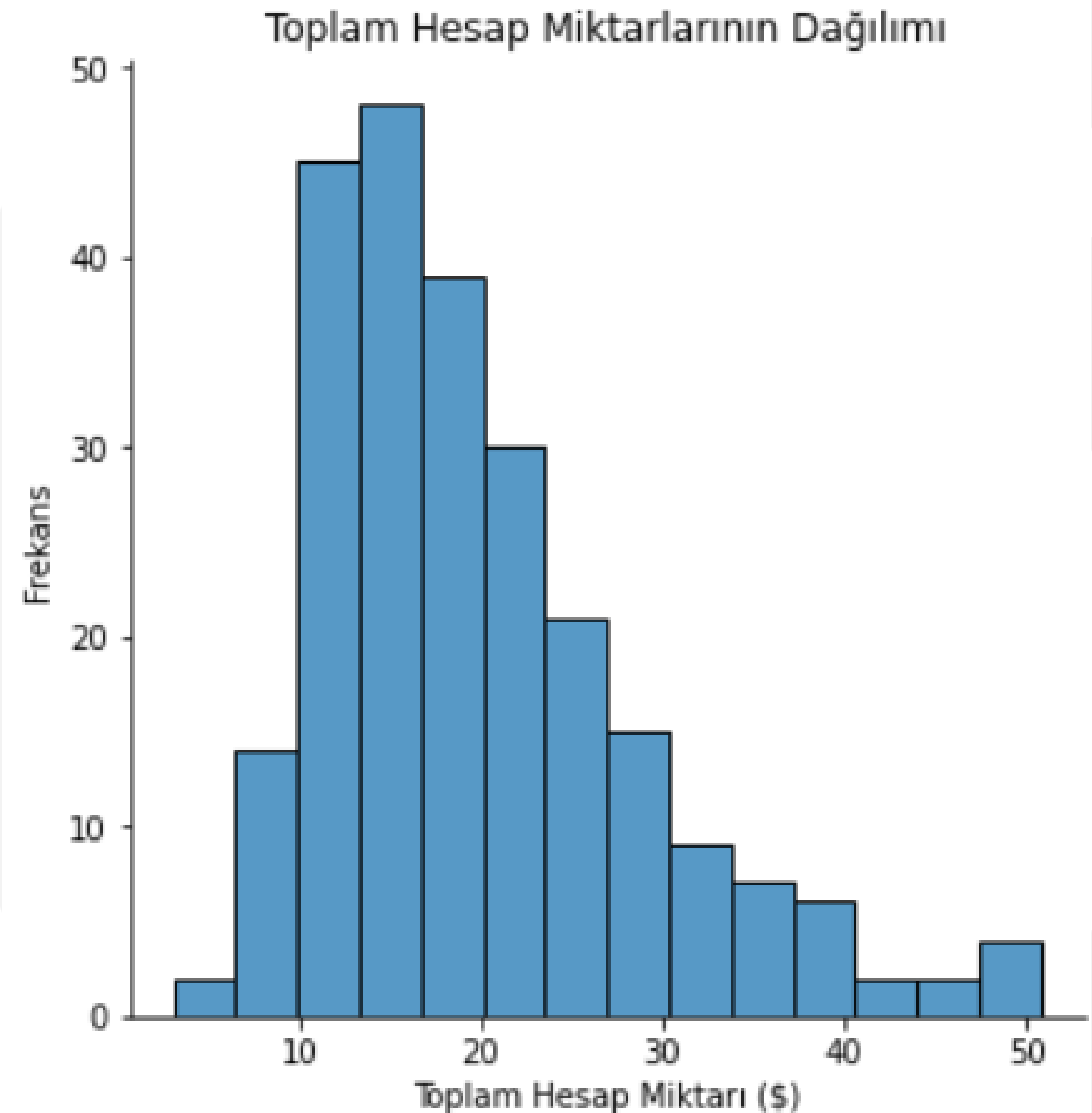
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Rugplot oluşturma
8 sns.rugplot(x="tip", data = tips, height = 0.3)
9
10 # Eksen etiketleri ve başlık
11 plt.xlabel('Bahşış Miktarı ($)')
12 plt.title('Bahşış Miktarlarının Dağılımı')
13
14 # Grafiki göster
15 plt.show()
```



DISTRUBITION PLOT – DISPLOT

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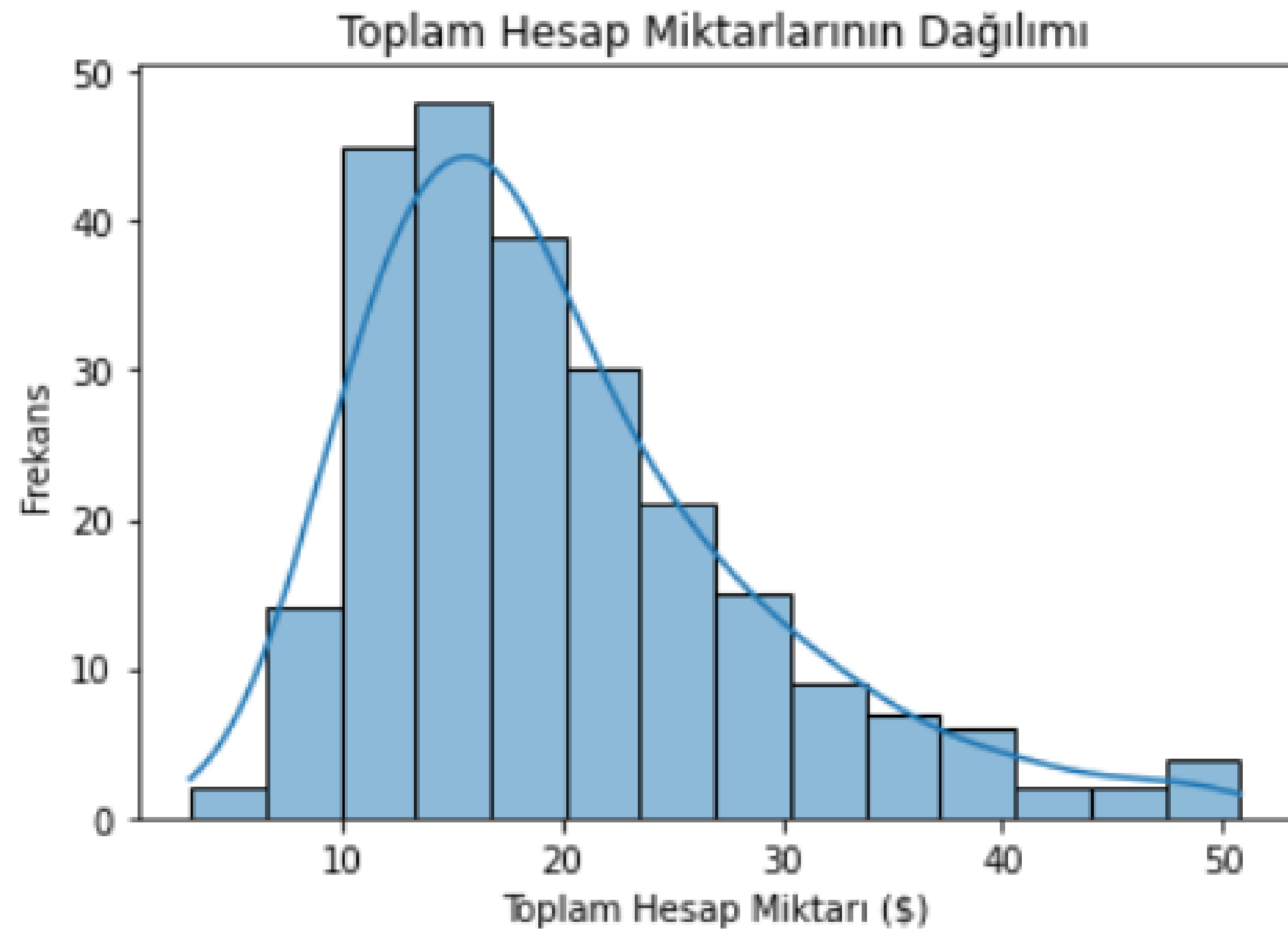
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Displot oluşturma
8 sns.displot(tips['total_bill'])
9
10 # Eksen etiketleri ve başlık
11 plt.xlabel('Toplam Hesap Miktarı ($)')
12 plt.ylabel('Frekans')
13 plt.title('Toplam Hesap Miktarlarının Dağılımı')
14
15 # Grafiki göster
16 plt.show()
```





DISTRUBITION PLOT – HISTPLOT

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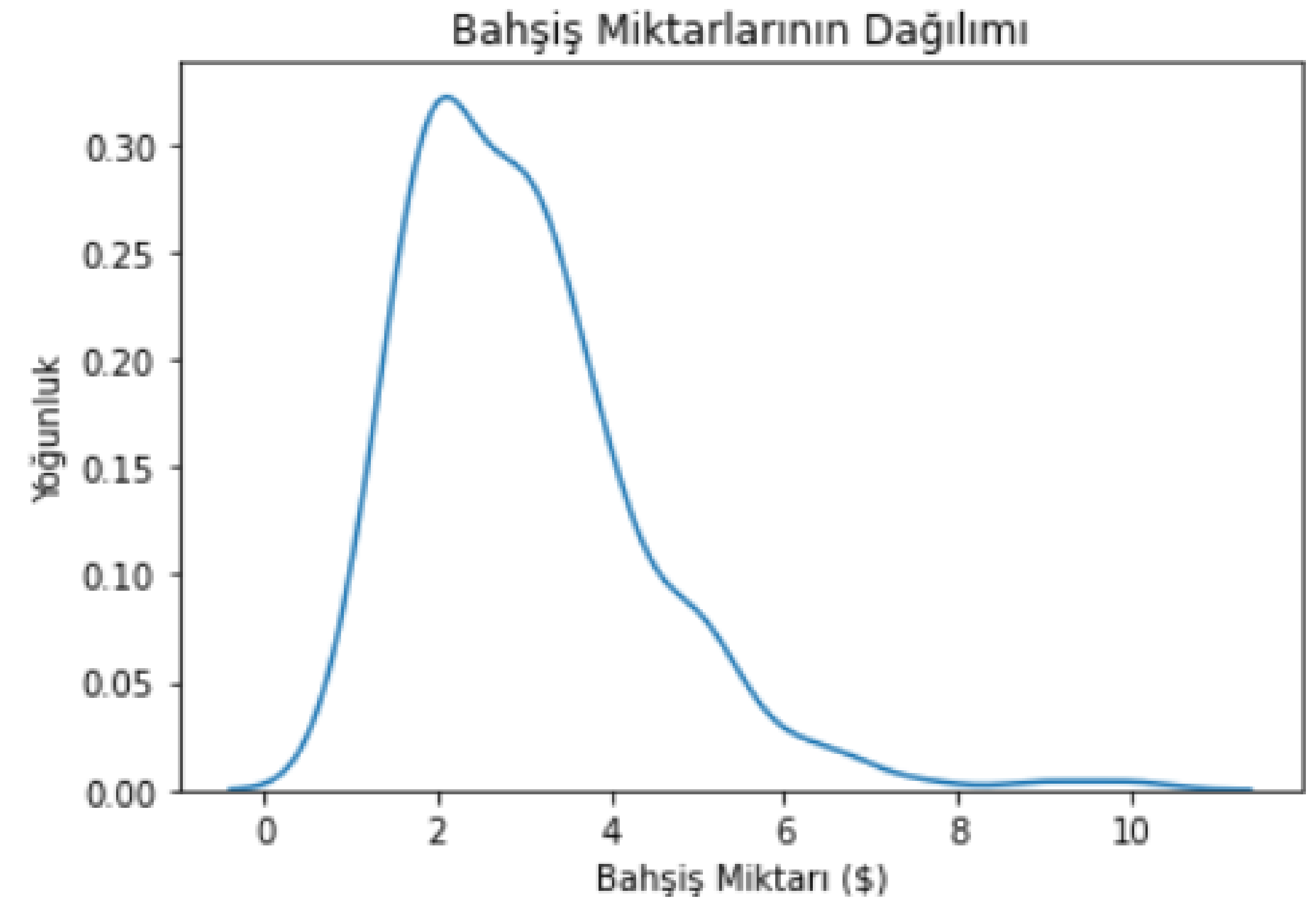
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Histplot oluşturma
8 sns.histplot(tips['total_bill'], kde=True)
9
10 # Eksen etiketleri ve başlık
11 plt.xlabel('Toplam Hesap Miktarı ($)')
12 plt.ylabel('Frekans')
13 plt.title('Toplam Hesap Miktarlarının Dağılımı')
14
15 # Grafiki göster
16 plt.show()
```



DISTRUBITION PLOT – KDEPLOT

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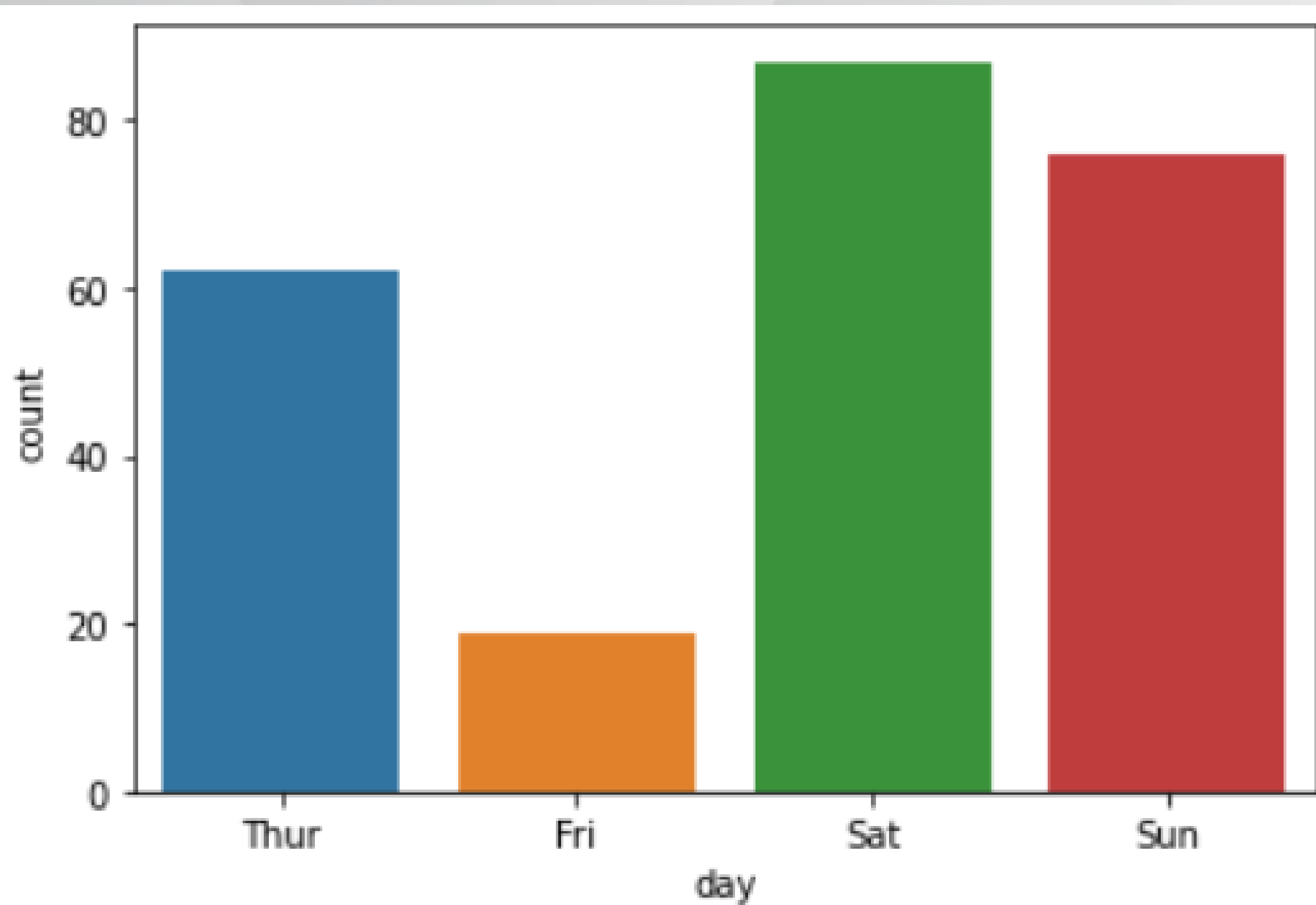
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # KDE plot oluşturma
8 sns.kdeplot(tips['tip'])
9
10 # Eksen etiketleri ve başlık
11 plt.xlabel('Bahşış Miktarı ($)')
12 plt.ylabel('Yoğunluk')
13 plt.title('Bahşış Miktarlarının Dağılımı')
14
15 # Grafiki göster
16 plt.show()
```





CATEGORICAL PLOT – COUNTPLOT

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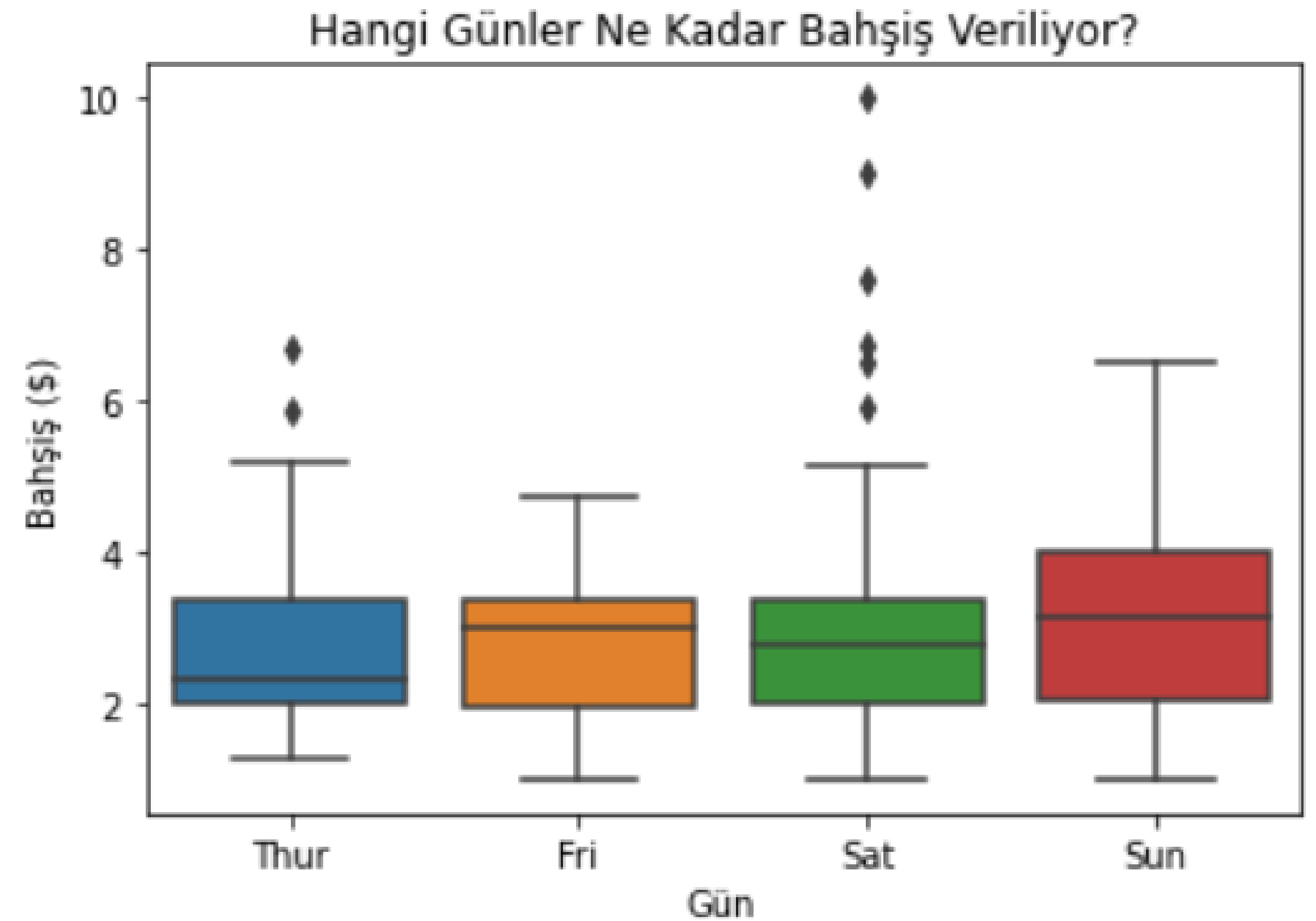
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Countplot oluşturma
8 sns.countplot(x="day", data=tips)
9
10 # Grafiki göster
11 plt.show()
```



CATEGORICAL PLOT – BOXPLOT

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```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Boxplot oluşturma
8 sns.boxplot(x='day', y='tip', data=tips)
9
10 # Eksen etiketleri ve başlık
11 plt.xlabel('Gün')
12 plt.ylabel('Bahşiş ($)')
13 plt.title('Hangi Günler Ne Kadar Bahşiş Veriliyor?')
14
15 # Grafiki göster
16 plt.show()
```

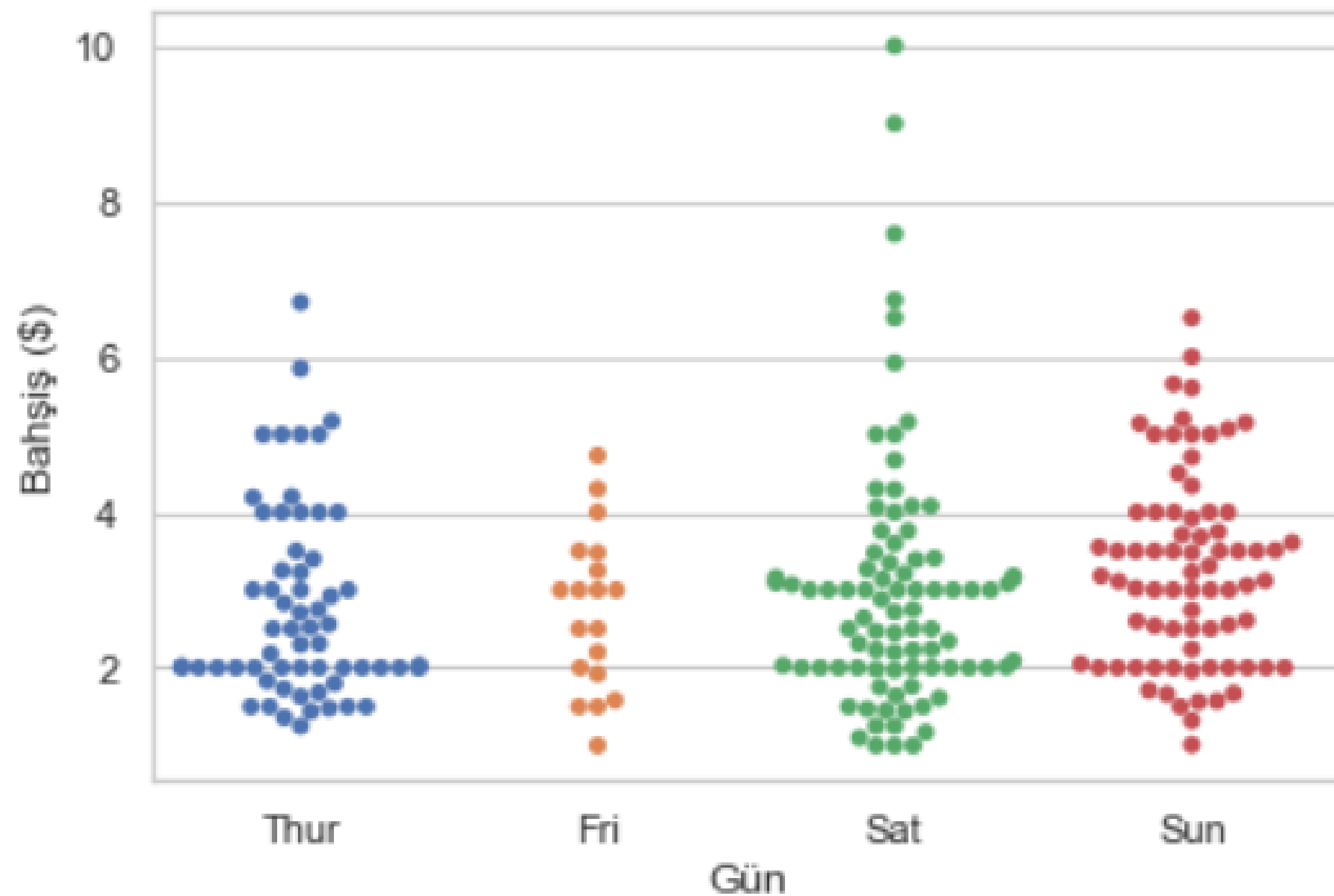




CATEGORICAL PLOT – SWARMPLOT

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Farklı Günlerde Alınan Bahşış Miktarları (Swarm Plot)



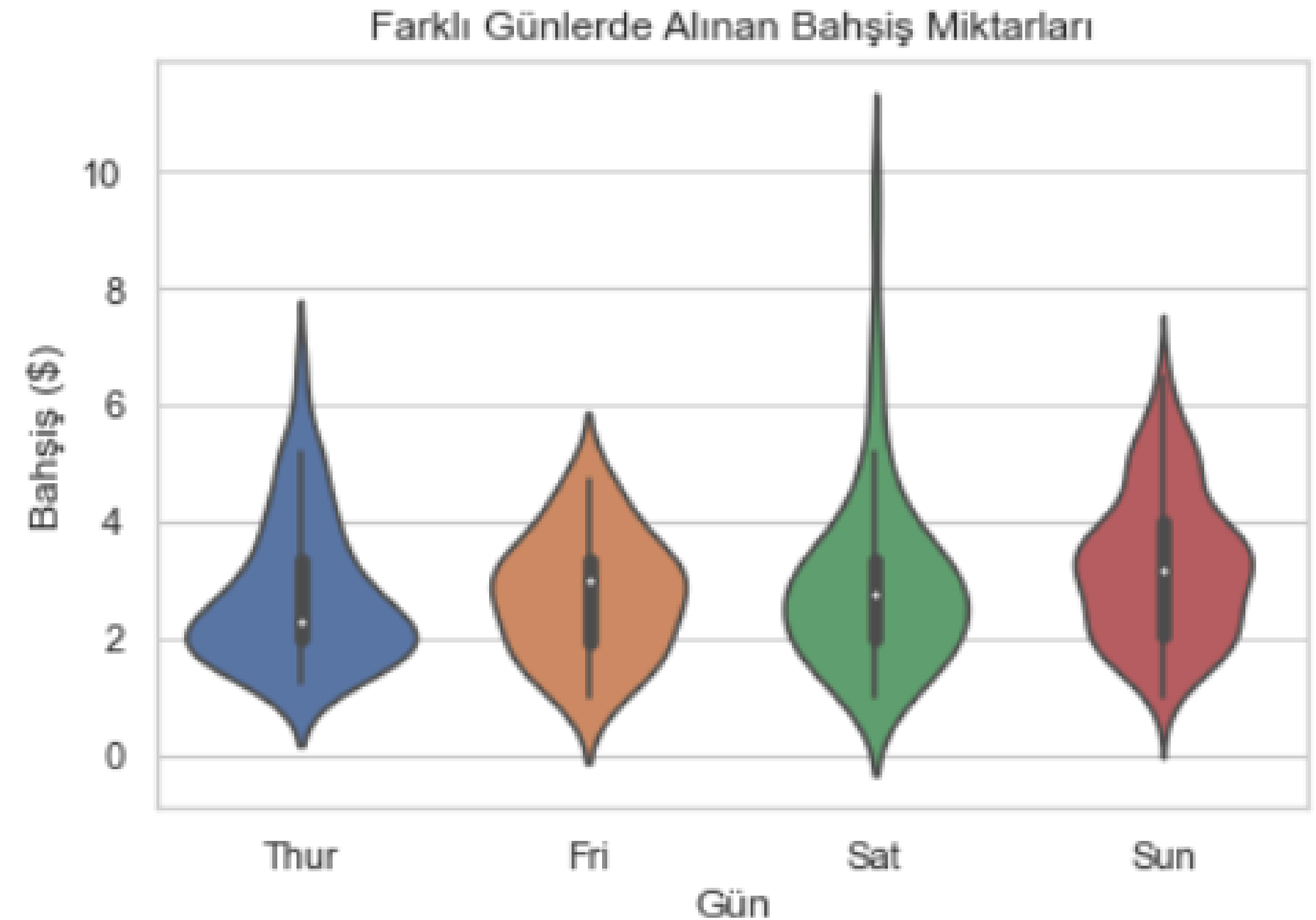
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Swarm plot oluşturma
8 sns.swarmplot(x="day", y="tip", data=tips)
9
10 # Başlık ve etiketler
11 plt.title('Farklı Günlerde Alınan Bahşış Miktarları (Swarm Plot)')
12 plt.xlabel('Gün')
13 plt.ylabel('Bahşış ($)')
14
15 # Grafiki göster
16 plt.show()
```



CATEGORICAL PLOT – VIOLINPLOT

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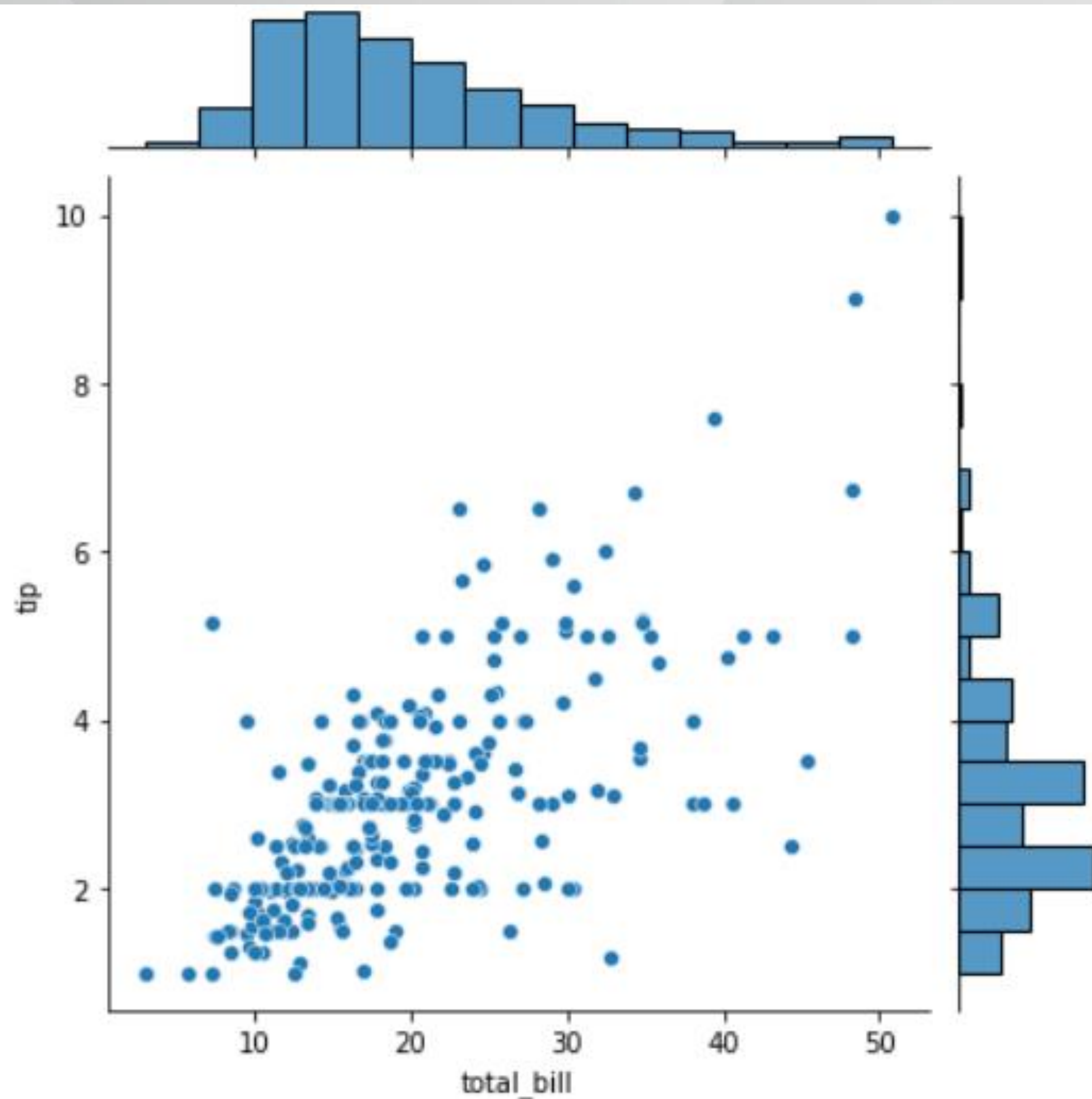
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Violin plot oluşturma
8 sns.violinplot(x="day", y="tip", data=tips)
9
10 # Başlık ve etiketler
11 plt.title('Farklı Günlerde Alınan Bahşiş Miktarları')
12 plt.xlabel('Gün')
13 plt.ylabel('Bahşiş ($)')
14
15 # Grafiki göster
16 plt.show()
```





COMPARISON PLOTS – JOINTPLOT

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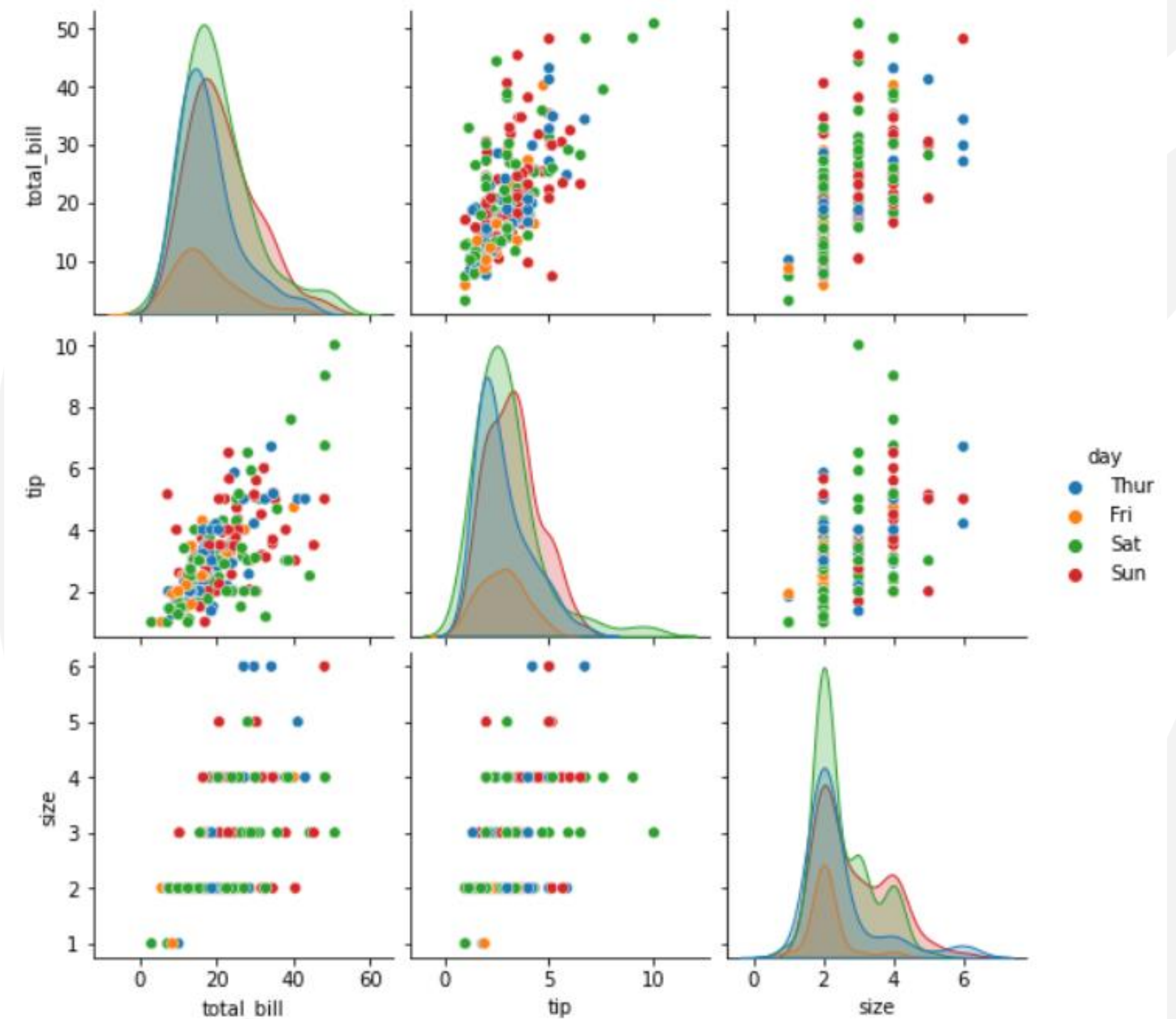
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Jointplot oluşturma
8 sns.jointplot(x='total_bill', y='tip', data=tips)
9
10 # Grafiki göster
11 plt.show()
```



COMPARISON PLOTS – PAIRPLOT

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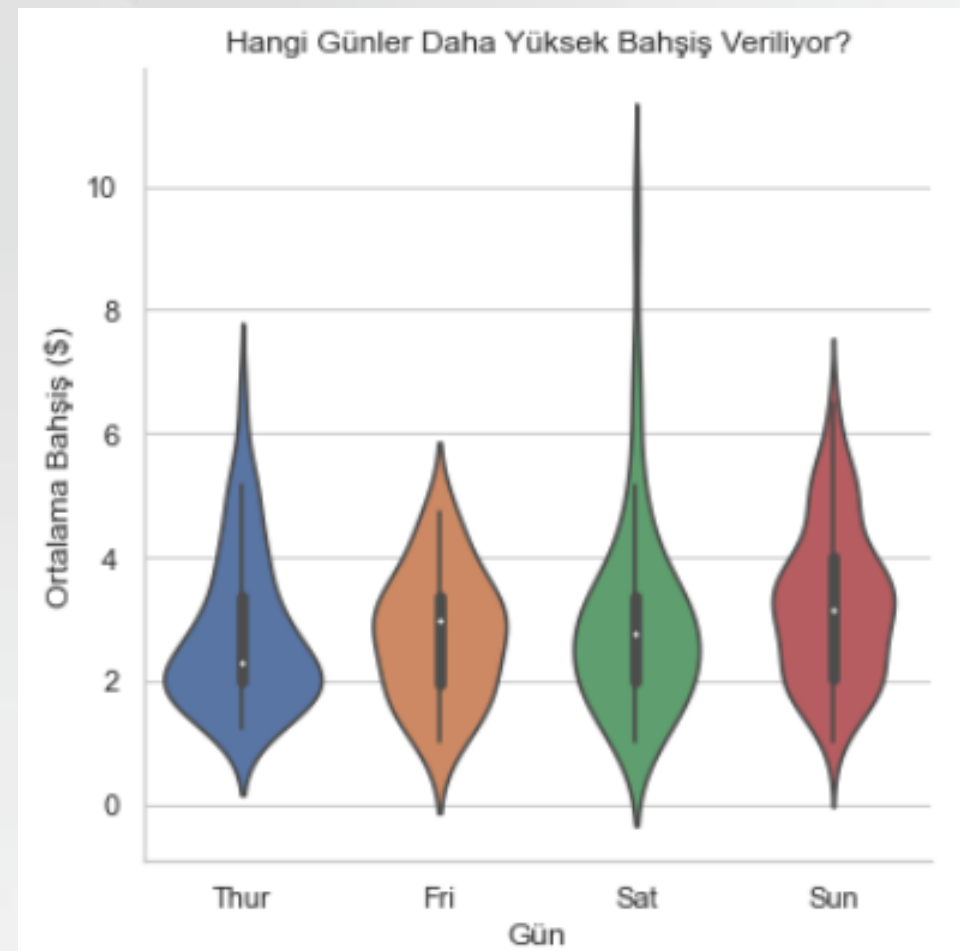
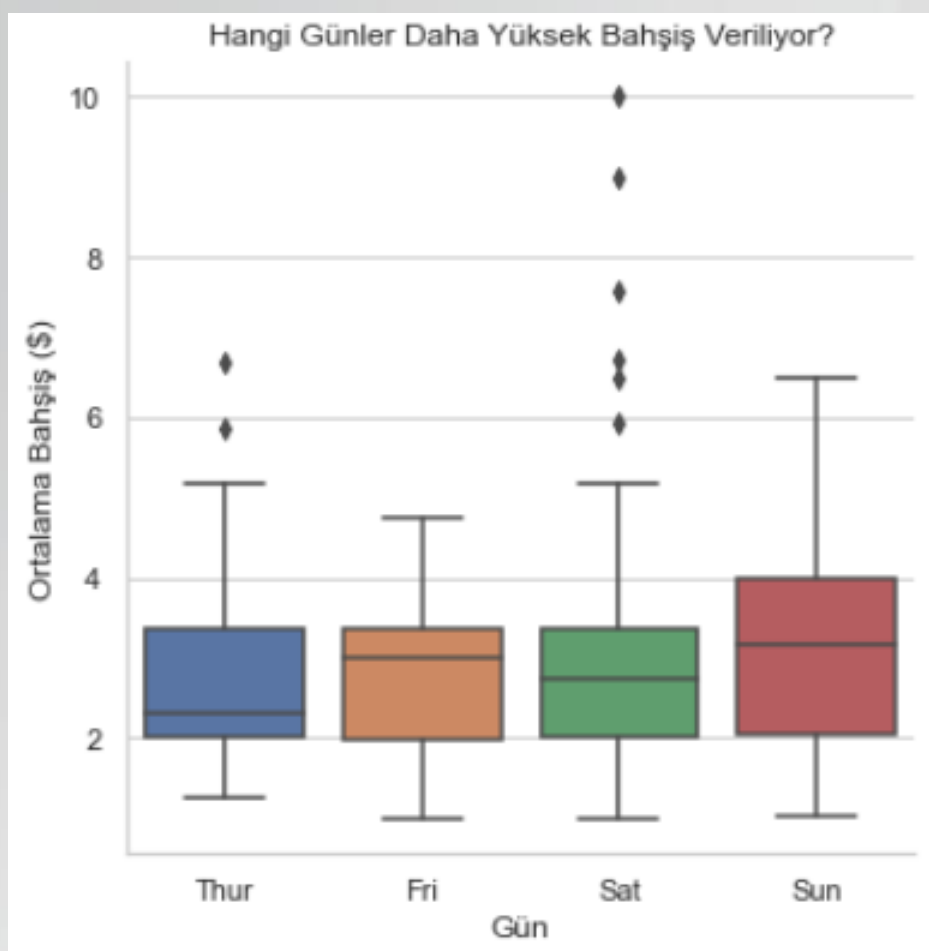
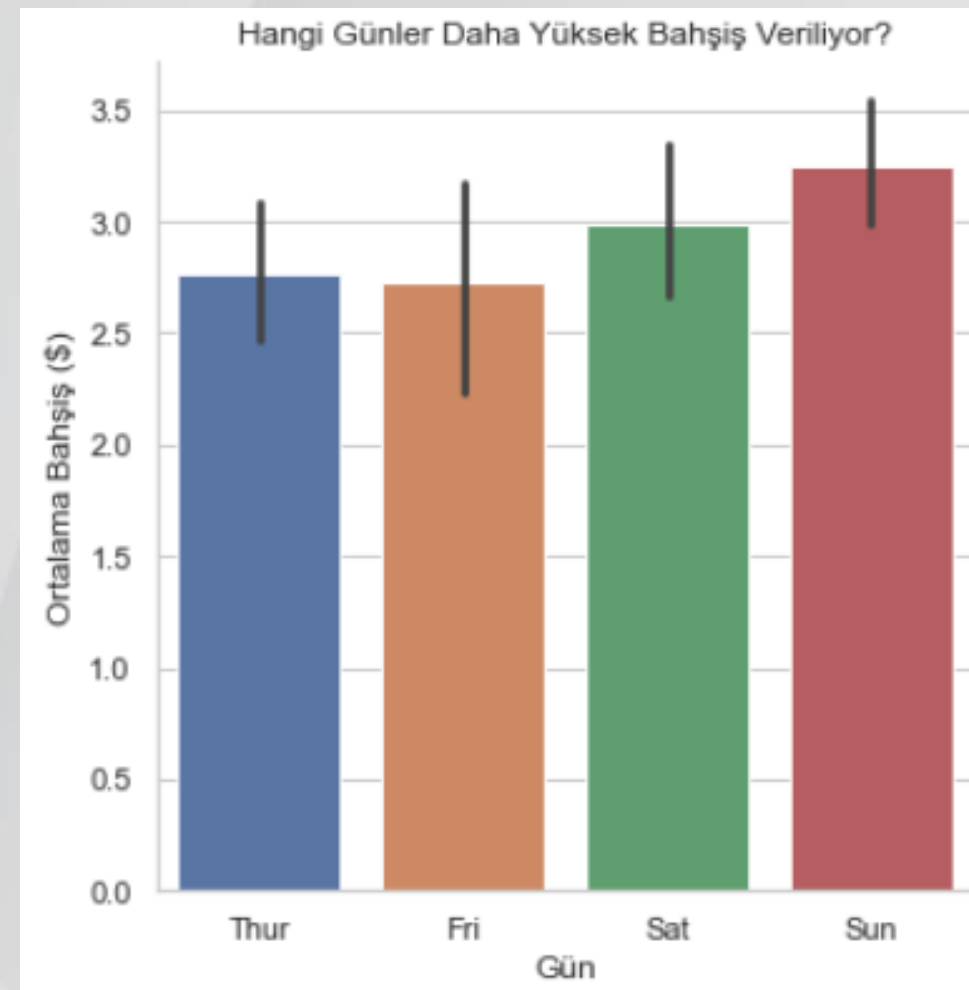
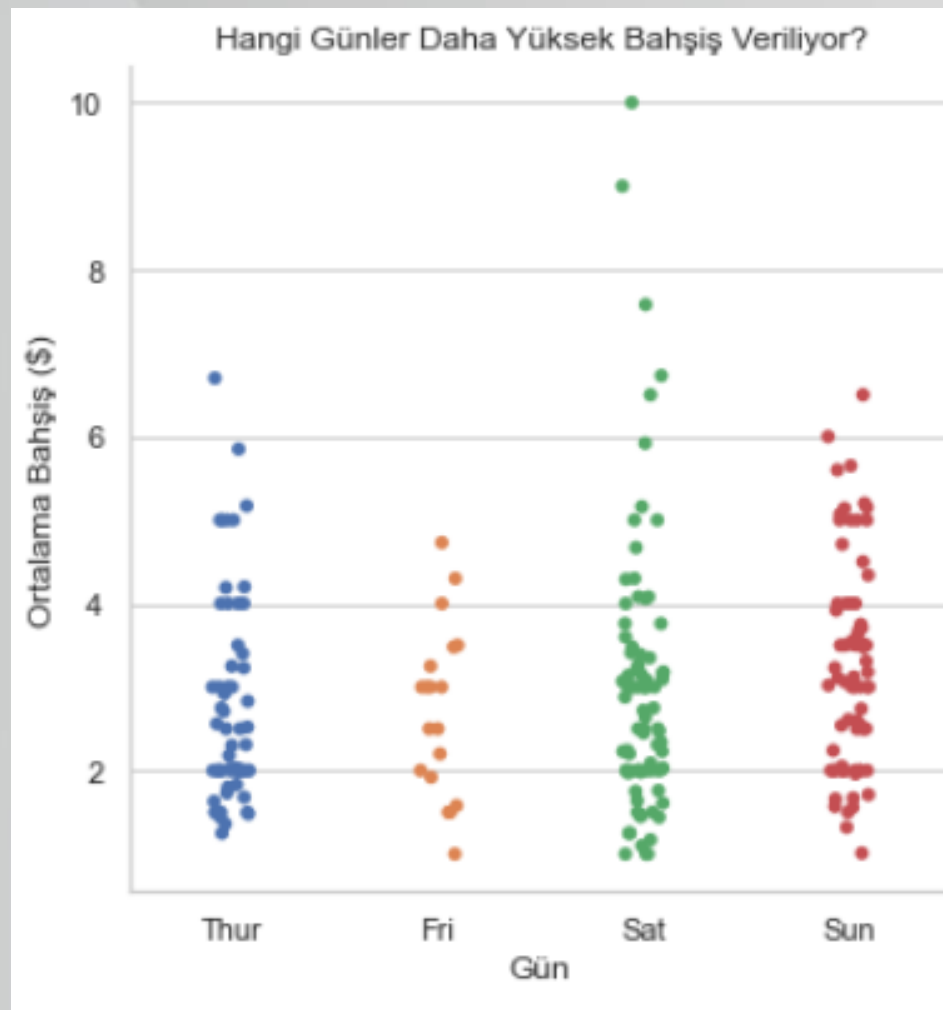
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Pairplot oluşturma
8 sns.pairplot(tips, hue = "day")
9
10 # Grafiki göster
11 plt.show()
```





COMPARISON PLOTS – CATPLOT

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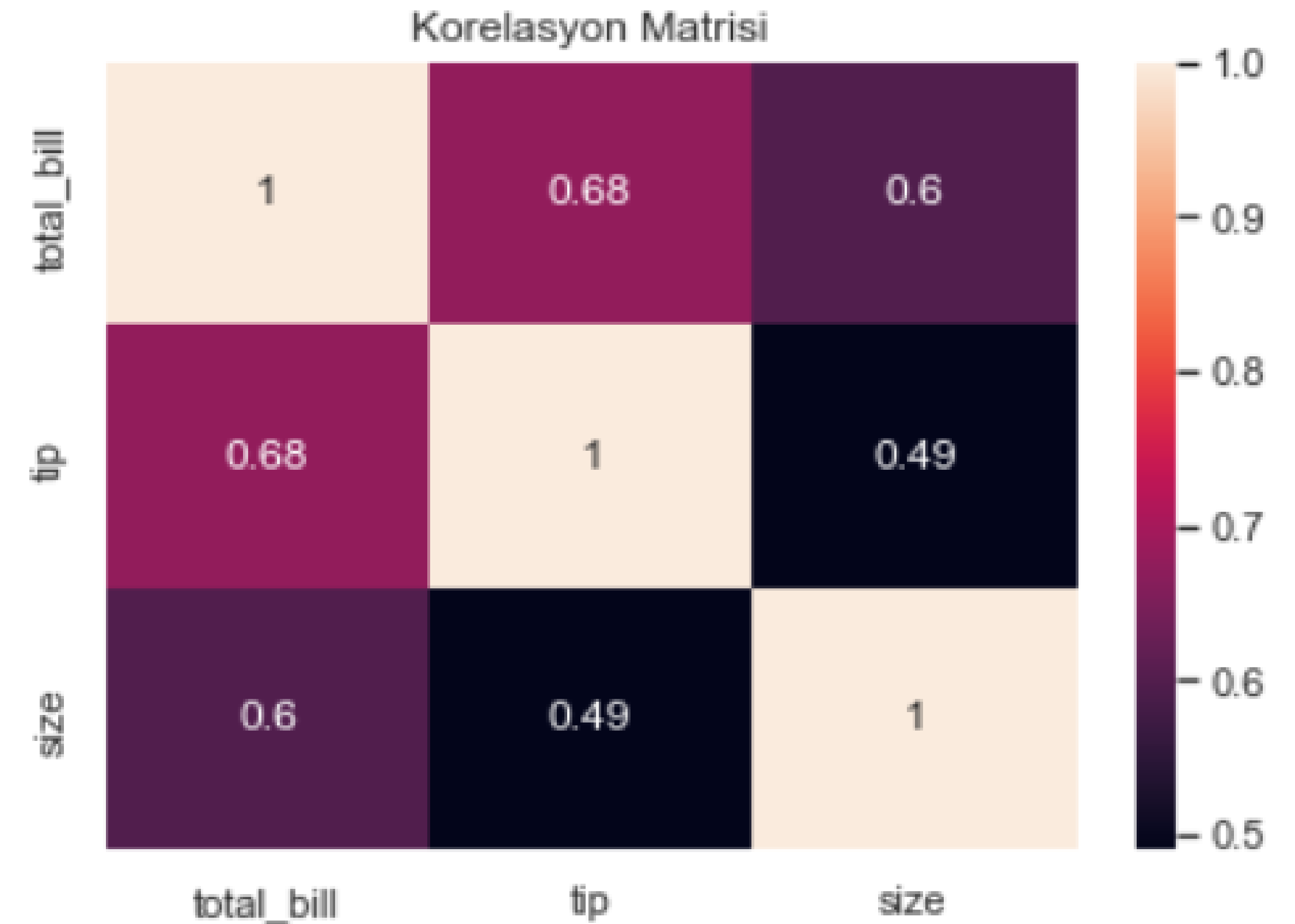
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Catplot oluşturma (bar plot türünde)
8 sns.catplot(x='day', y='tip', data=tips) ##kind="bar", kind="box", kind="violin"
9
10 # Eksen etiketleri ve başlık
11 plt.xlabel('Gün')
12 plt.ylabel('Ortalama Bahşiş ($)')
13 plt.title('Hangi Günler Daha Yüksek Bahşiş Veriliyor?')
14
15 # Grafiki göster
16 plt.show()
```



COMPARISON PLOTS – MATRIXPLOT

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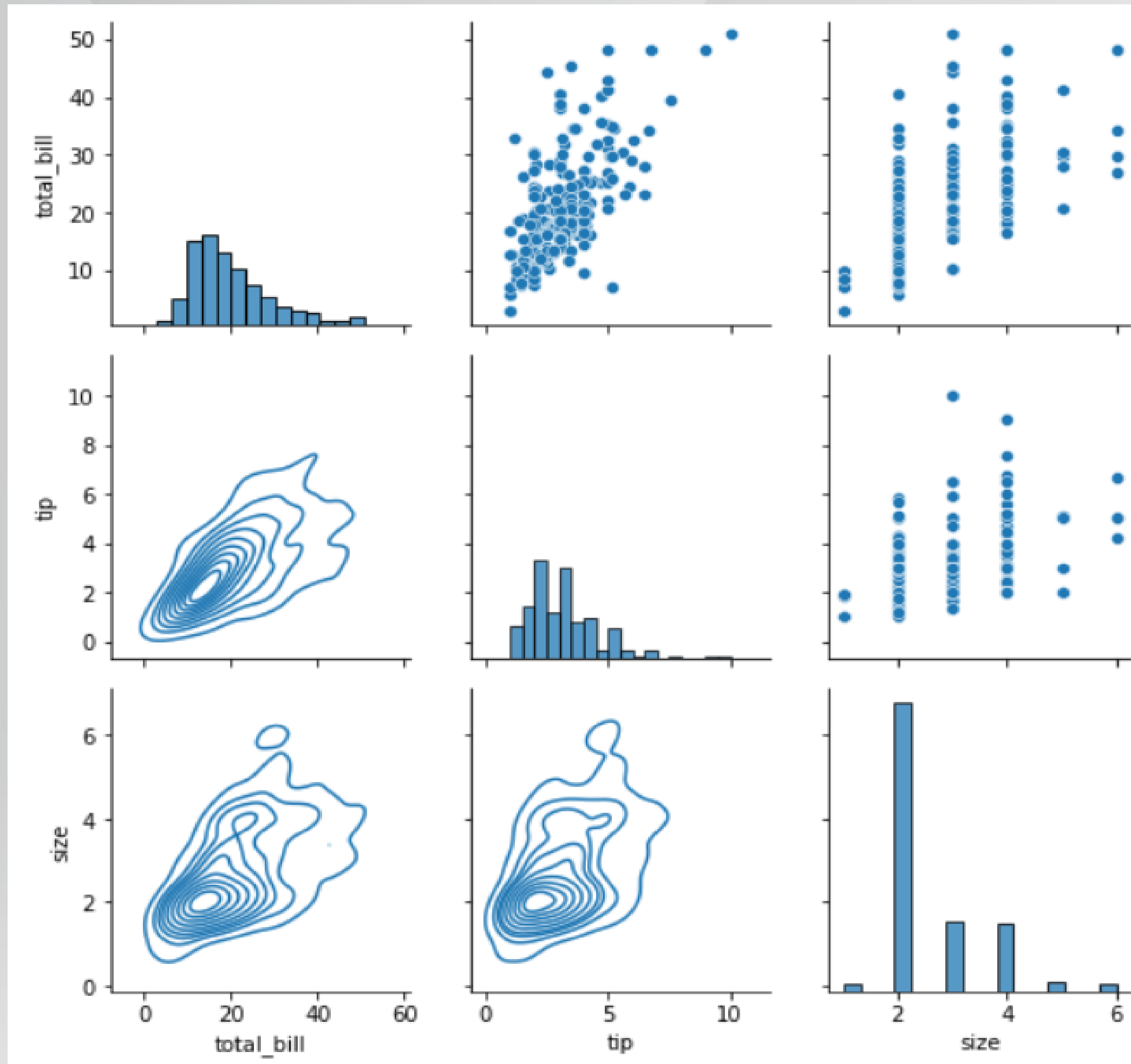
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # Korelasyon matrisini hesapla
8 correlation_matrix = tips.corr()
9
10 # Isı haritası oluşturma
11 sns.heatmap(correlation_matrix, annot=True)
12
13 # Eksen etiketleri ve başlık
14 plt.title('Korelasyon Matrisi')
15
16 # Grafiki göster
17 plt.show()
```





GRIDS-PAIRGRID

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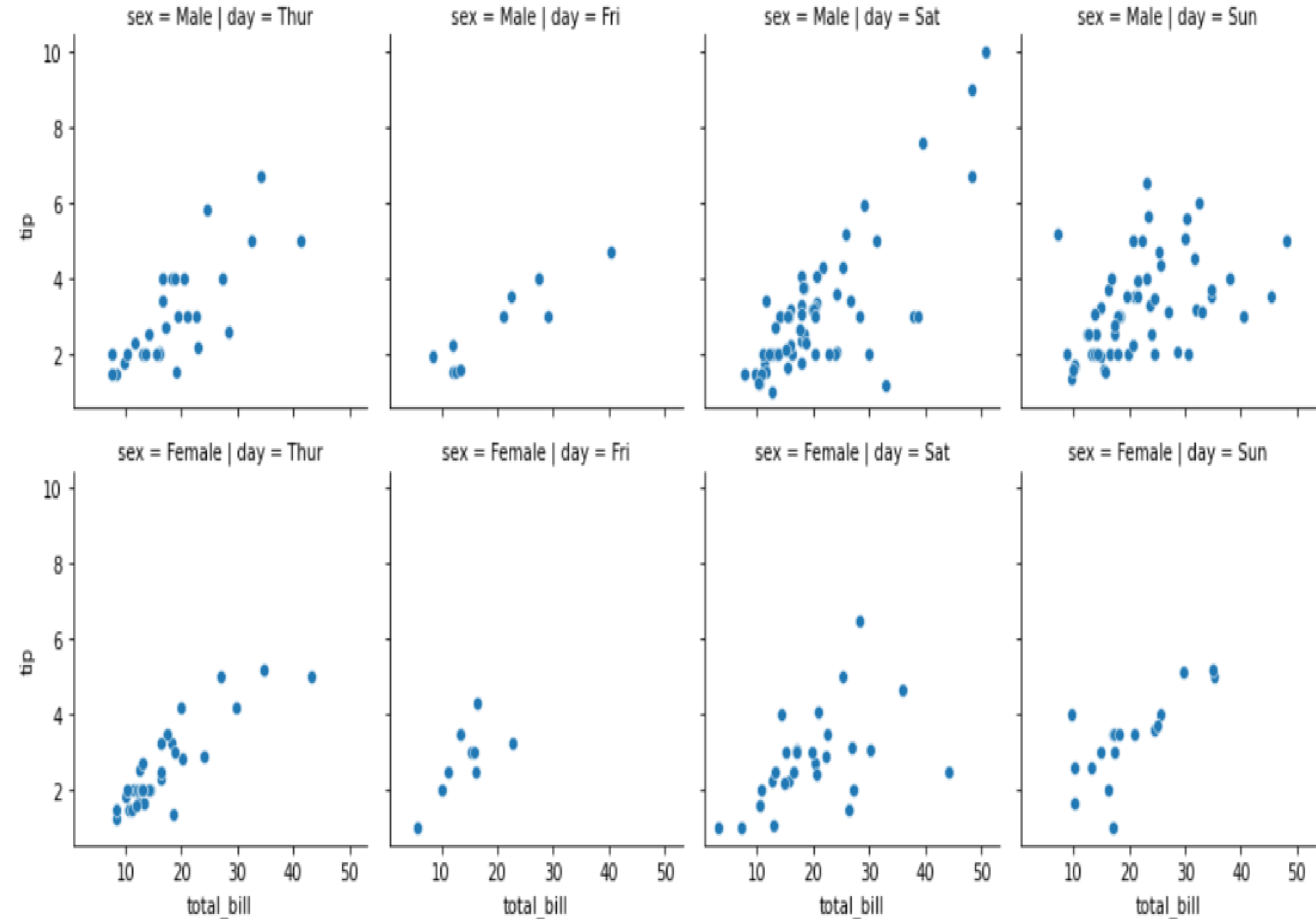
```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # PairGrid oluşturma
8 g = sns.PairGrid(tips)
9
10 # Üst üçgen matrise scatter plot ekleyelim
11 g.map_upper(sns.scatterplot)
12
13 # Köşegen matrise histogram ekleyelim
14 g.map_diag(sns.histplot)
15
16 # Alt üçgen matrise korelasyon katsayısı ekleyelim
17 g.map_lower(sns.kdeplot)
18
19 # Grafiki göster
20 plt.show()
```



GRIDS- FACETGRID

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```
1 import seaborn as sns
2 import matplotlib.pyplot as plt
3
4 # Tips veri setini yükle
5 tips = sns.load_dataset("tips")
6
7 # FacetGrid oluşturma
8 g = sns.FacetGrid(tips, col="day", row="sex")
9
10 # Her bir alt grafiğe bir scatter plot ekleyelim
11 g.map(sns.scatterplot, "total_bill", "tip")
12
13 # Grafiki göster
14 plt.show()
```



Coffee break...

00:00

