Python Matplotlib

Matplotlib is a python library used for data visualization

matplotlib

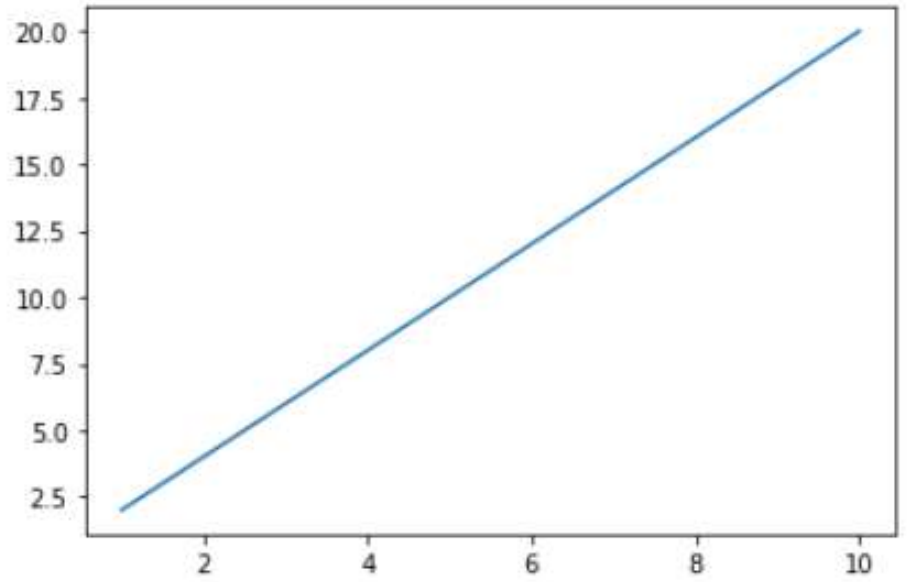
Line Plot

```
In [1]: import numpy as np
        from matplotlib import pyplot as plt
```

```
In [2]: x=np.arange(1,11)
        x
Out[2]: array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

```
In [4]: y= 2*x
        y
Out[4]: array([ 2,  4,  6,  8, 10, 12, 14, 16, 18, 20])
```

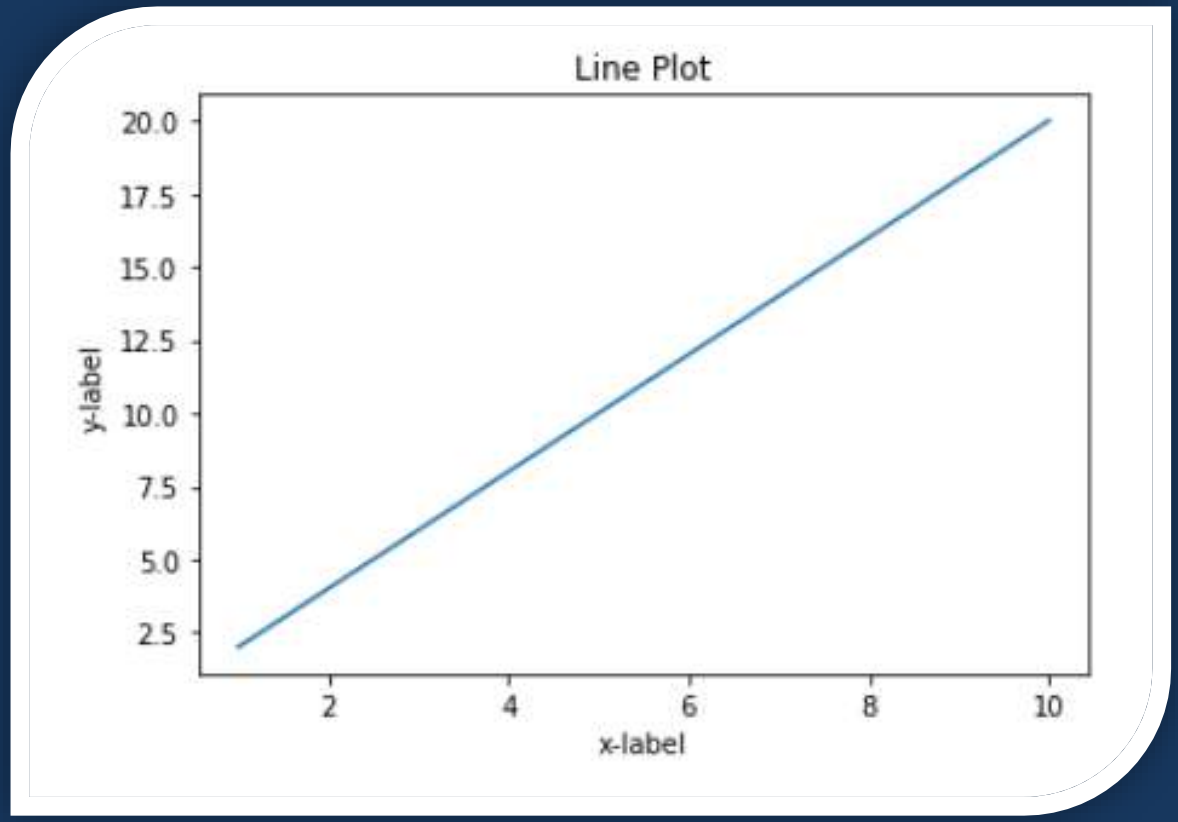
```
In [6]: plt.plot(x,y)
        plt.show()
```



Line Plot

Adding Title and Labels

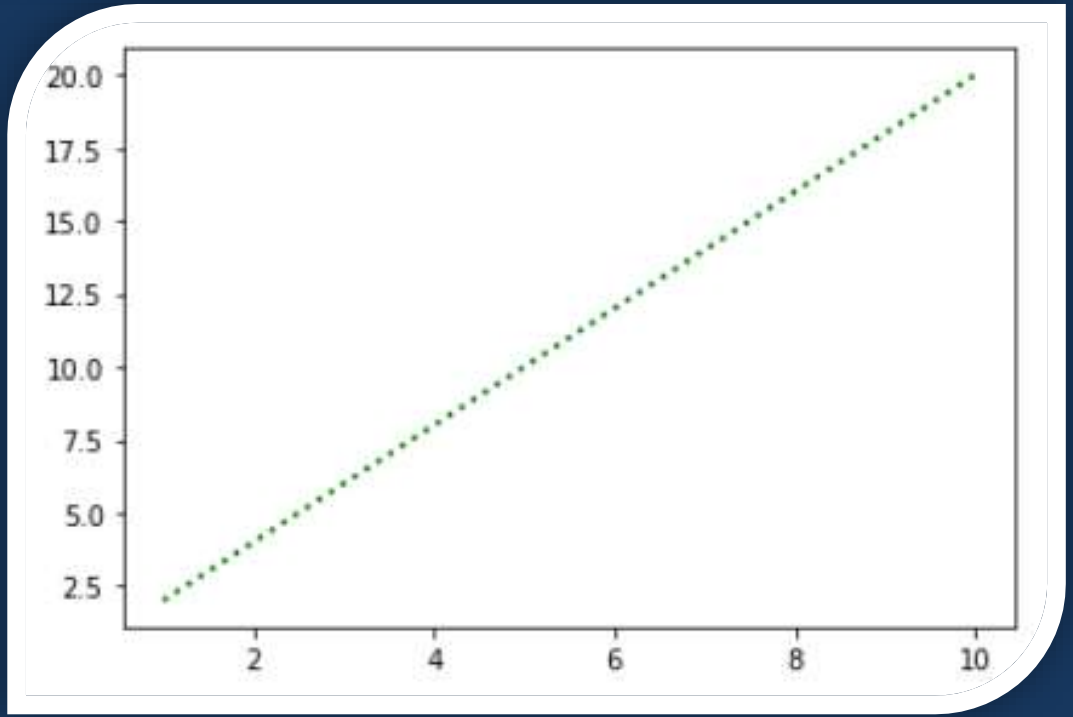
```
In [8]: plt.plot(x,y)
        plt.title("Line Plot")
        plt.xlabel("x-label")
        plt.ylabel("y-label")
        plt.show()
```



Line Plot

Changing Line Aesthetics

```
In [10]: plt.plot(x,y,color='g',linestyle=':',linewidth=2)
         plt.show()
```



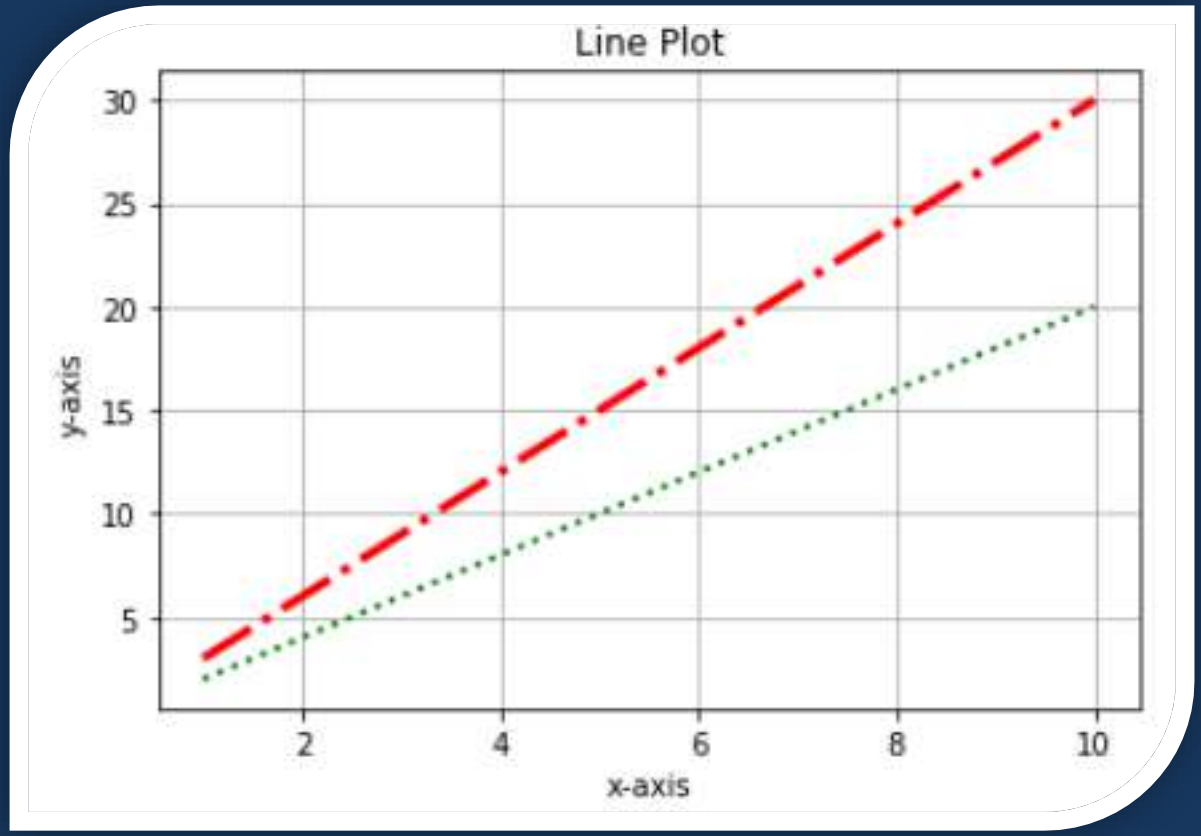
Line Plot

Adding two lines in the same plot

```
In [2]: x=np.arange(1,11)
        y1=2*x
        y2=3*x
```

```
In [11]: plt.plot(x,y1,color='g',linestyle=':',linewidth=2)
         plt.plot(x,y2,color='r',linestyle='-.',linewidth=3)
         plt.title("Line Plot")
         plt.xlabel("x-axis")
         plt.ylabel("y-axis")
         plt.grid(True)
         plt.show()
```

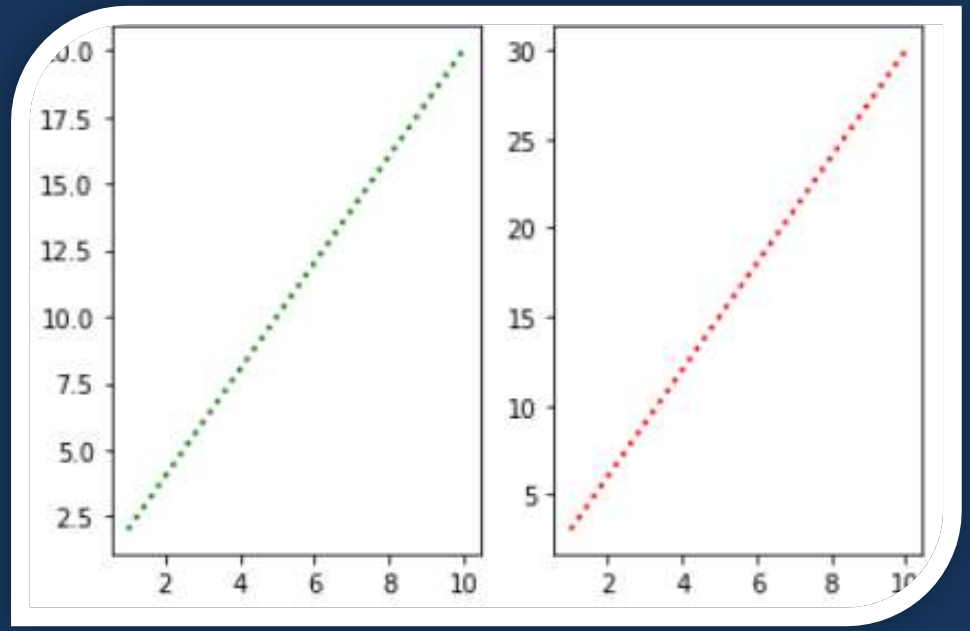
Line Plot



Line Plot

Adding sub-plots

```
x=np.arange(1,11)
y1=2*x
y2=3*x

plt.subplot(1,2,1)
plt.plot(x,y1,color='g',linestyle=':',linewidth=2)

plt.subplot(1,2,2)
plt.plot(x,y2,color='r',linestyle=':',linewidth=2)

plt.show()
```

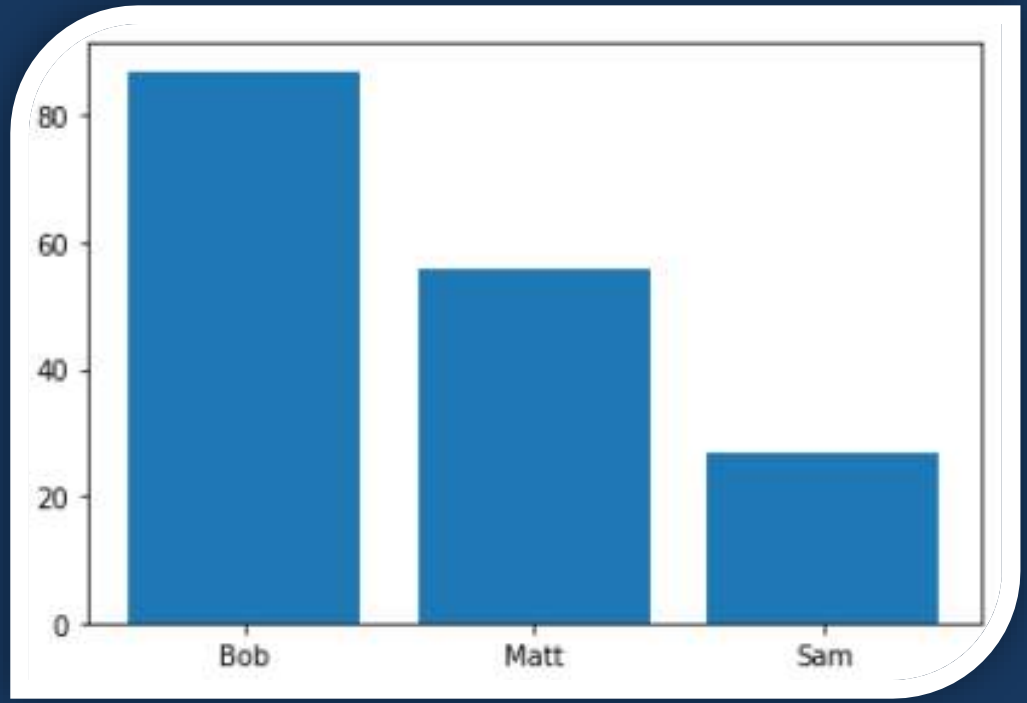


Bar Plot

```
[39]: student = {"Bob":87,"Matt":56,"Sam":27}
```

```
In [40]: names = list(student.keys())
         values = list(student.values())
```

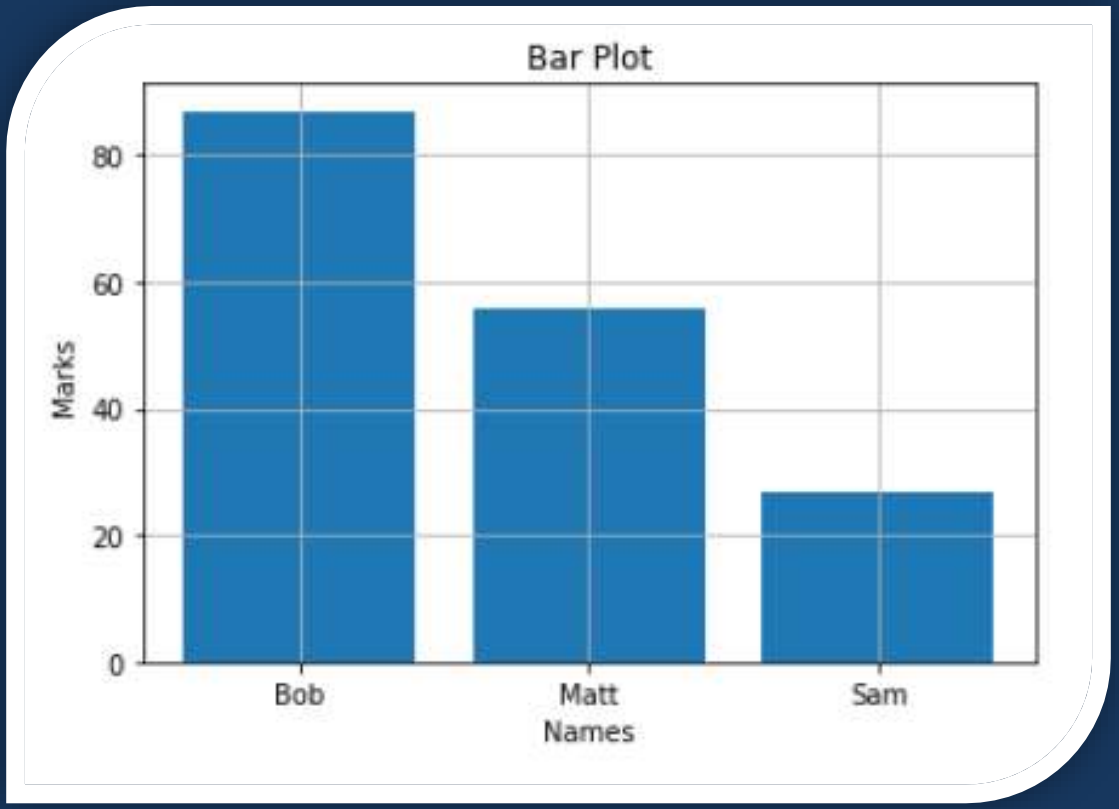
```
In [42]: plt.bar(names,values)
         plt.show()
```



Bar Plot

Adding Title and Labels

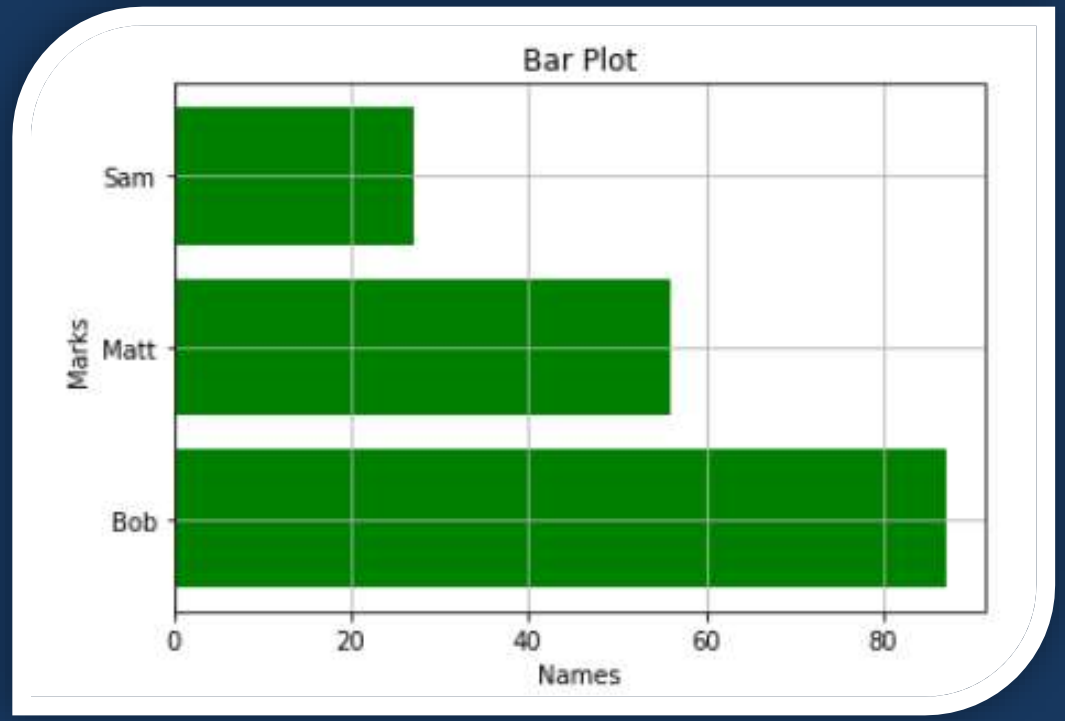
```
In [16]: plt.bar(names,values)
         plt.title("Bar Plot")
         plt.xlabel("Names")
         plt.ylabel("Marks")
         plt.grid(True)
         plt.show()
```



Horizontal Bar Plot

Horizontal Bar Plot

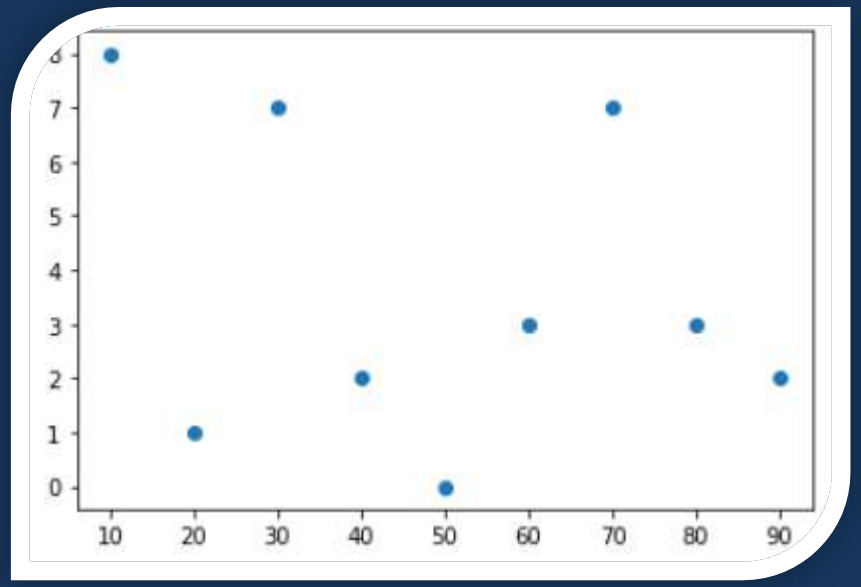
```
In [44]: plt.barh(names,values,color='g')
         plt.title("Bar Plot")
         plt.xlabel("Names")
         plt.ylabel("Marks")
         plt.grid(True)
         plt.show()
```



Scatter Plot

Creating a basic scatter-plot

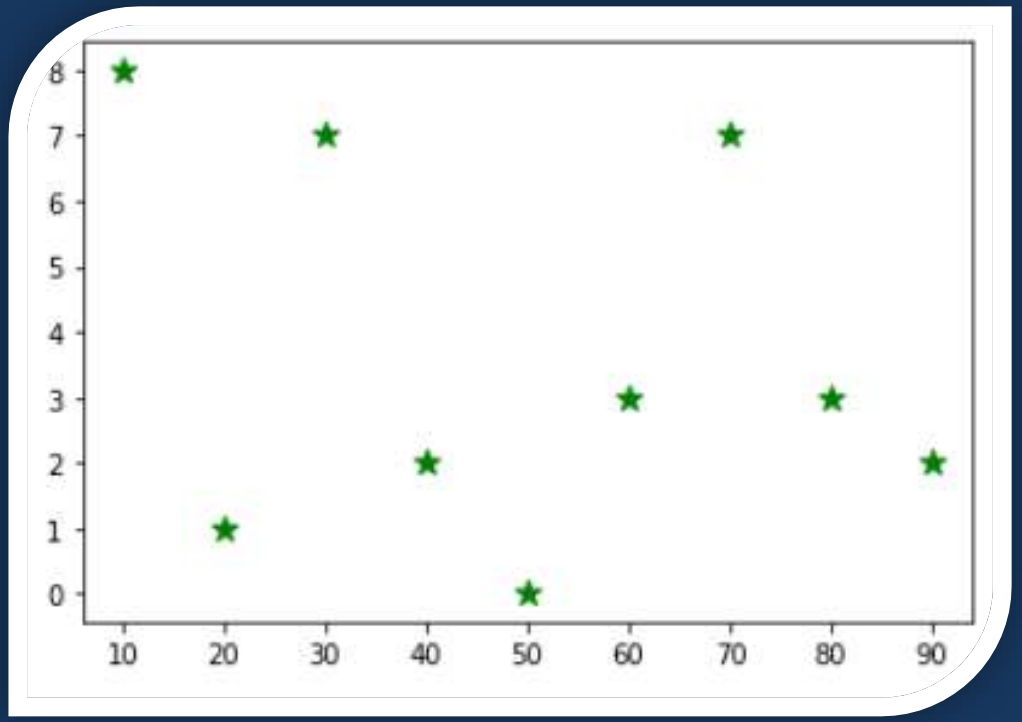
```
x=[10,20,30,40,50,60,70,80,90]
a=[8,1,7,2,0,3,7,3,2]

plt.scatter(x,a)
plt.show()
```



Scatter Plot

Changing Mark Aesthetics

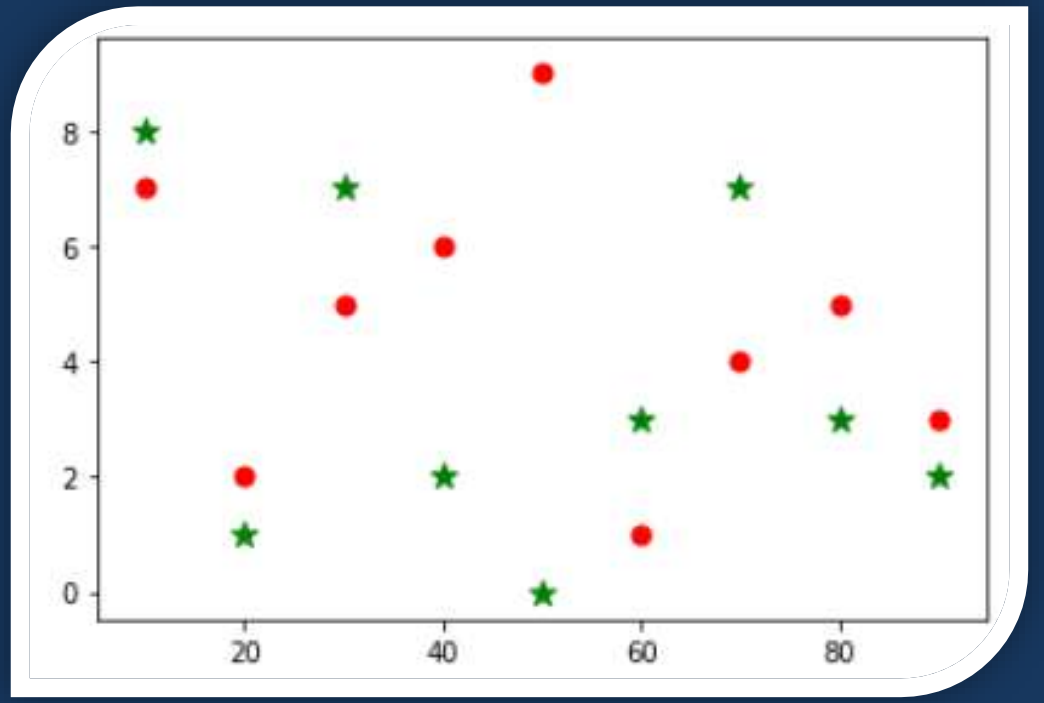
```
In [7]: x=[10,20,30,40,50,60,70,80,90]
        a=[8,1,7,2,0,3,7,3,2]
        plt.scatter(x,a,marker="*",c="g",s=100)
        plt.show()
```



Scatter Plot

Adding two markers in the same plot

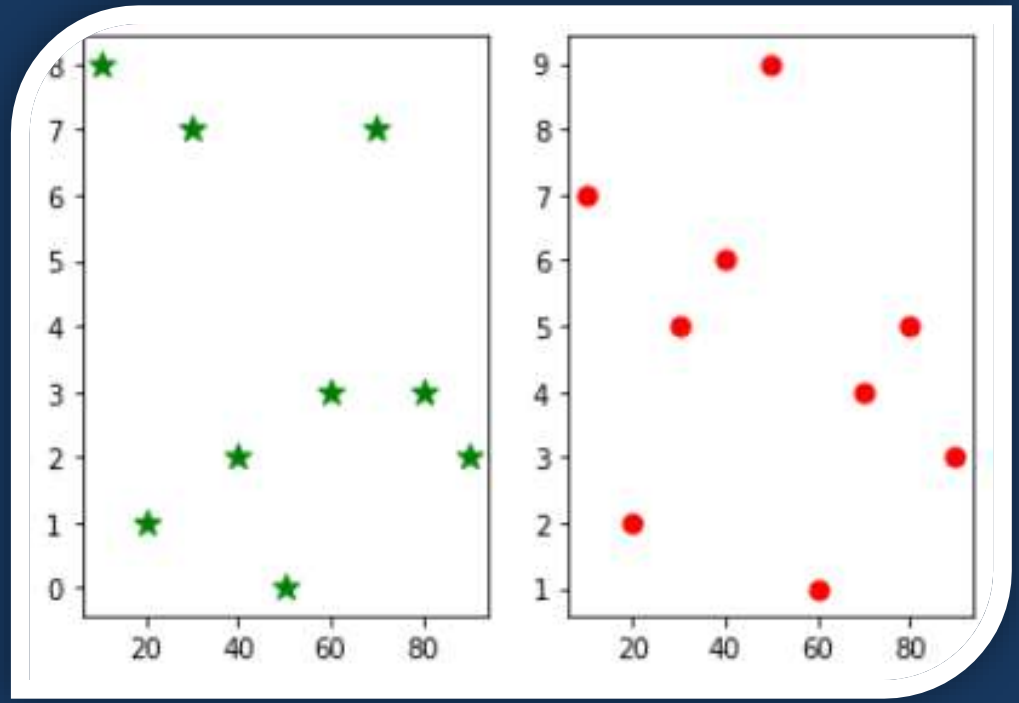
```
In [10]: x=[10,20,30,40,50,60,70,80,90]
         a=[8,1,7,2,0,3,7,3,2]
         b=[7,2,5,6,9,1,4,5,3]
         plt.scatter(x,a,marker="*",c="g",s=100)
         plt.scatter(x,b,marker=".",c="r",s=200)
         plt.show()
```



Scatter Plot

Adding sub-plots

```
x=[10,20,30,40,50,60,70,80,90]
a=[8,1,7,2,0,3,7,3,2]
b=[7,2,5,6,9,1,4,5,3]

plt.subplot(1,2,1)
plt.scatter(x,a,marker="*",c="g",s=100)

plt.subplot(1,2,2)
plt.scatter(x,b,marker=".",c="r",s=200)
plt.show()
```



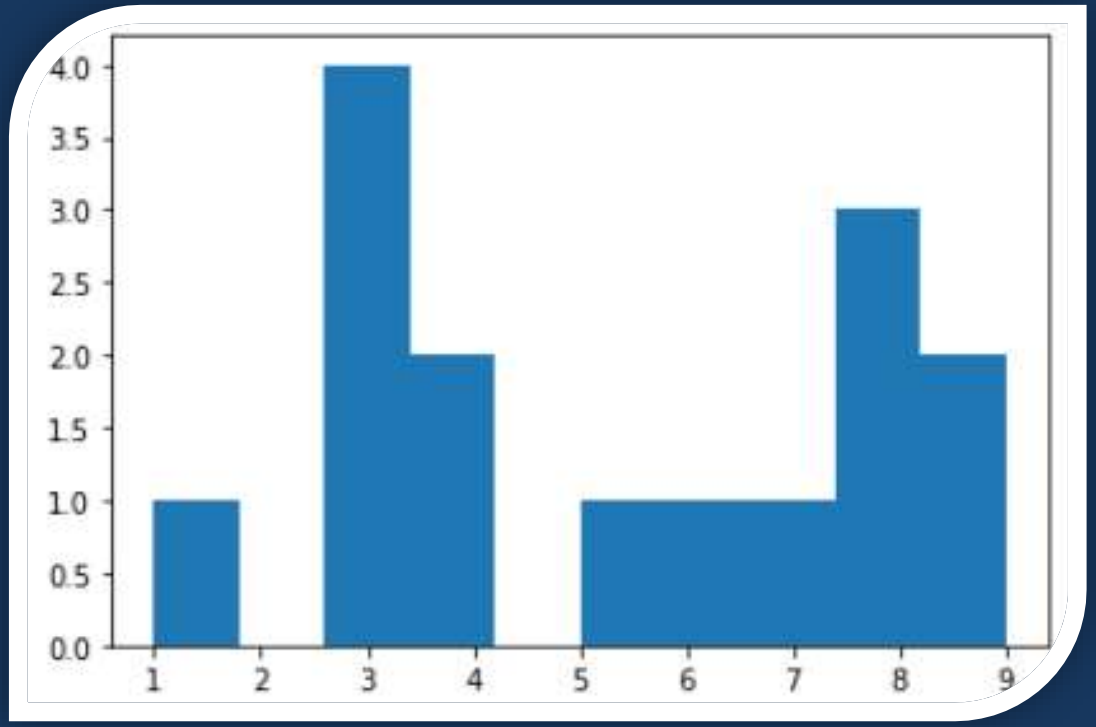
Histogram

Creating data

```
data = [1,3,3,3,3,9,9,5,4,4,8,8,8,6,7]
```

Making Histogram

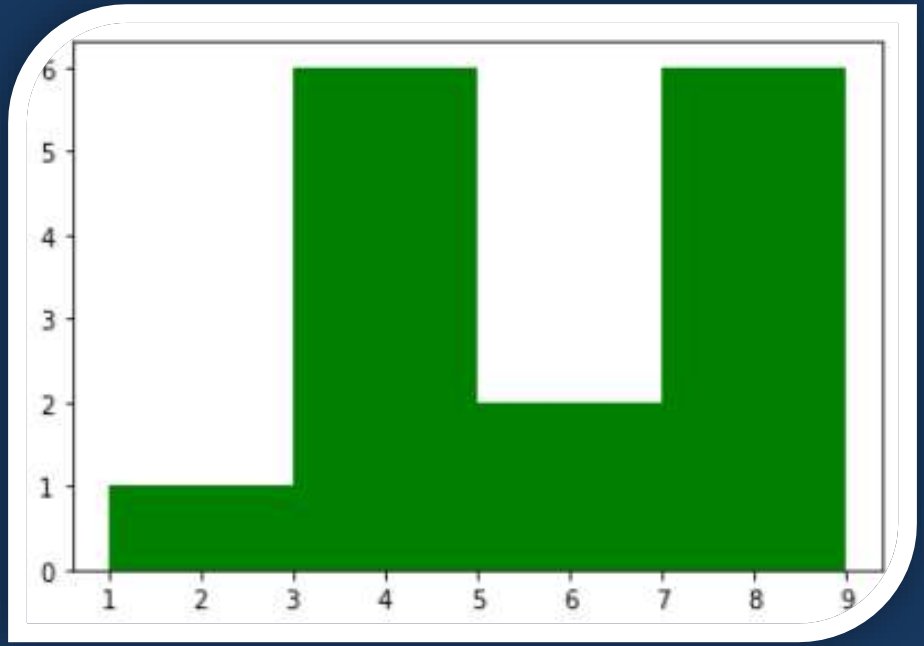
```
plt.hist(data)
plt.show()
```



Histogram

Changing Aesthetics

```
In [24]: plt.hist(data,color="g",bins=4)
         plt.show()
```

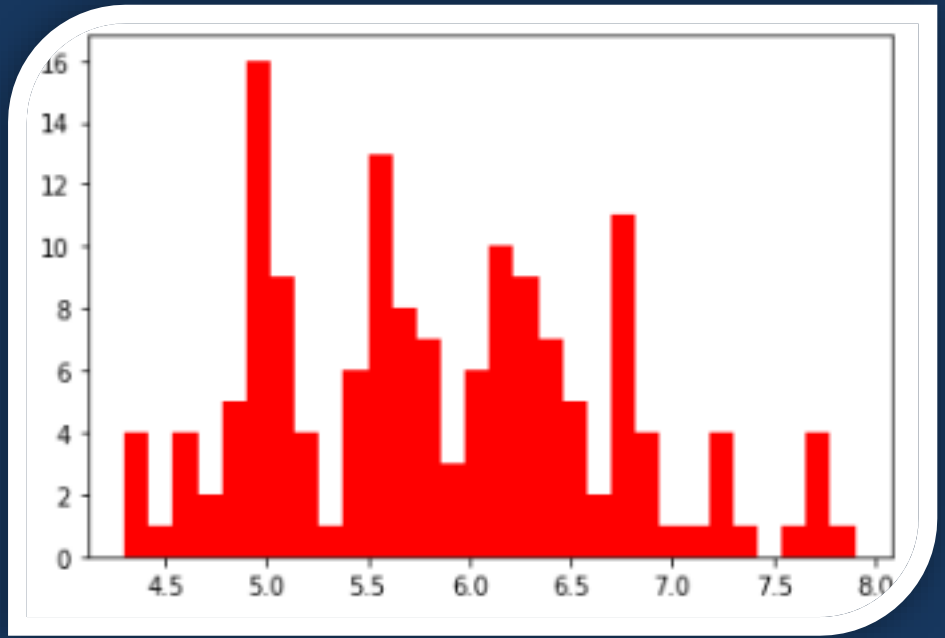


Histogram

Working with a dataset

```
iris=pd.read_csv('iris.csv')
iris.head()
```

```
plt.hist(iris['Sepal.Length'],bins=30,color="r")
plt.show()
```



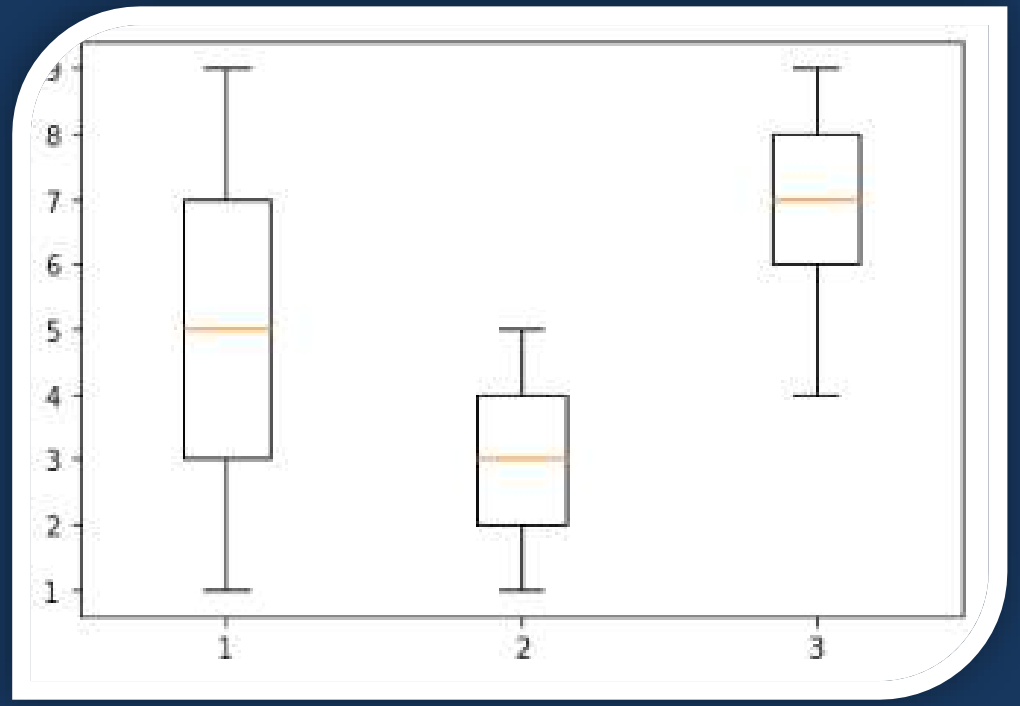
Box-Plot

Creating data

```
one = [1,2,3,4,5,6,7,8,9]
two = [1,2,3,4,5,4,3,2,1]
three = [6,7,8,9,8,7,6,5,4]

data =  list([one,two,three])
```

Making Plot

```
plt.boxplot(data)
plt.show()
```



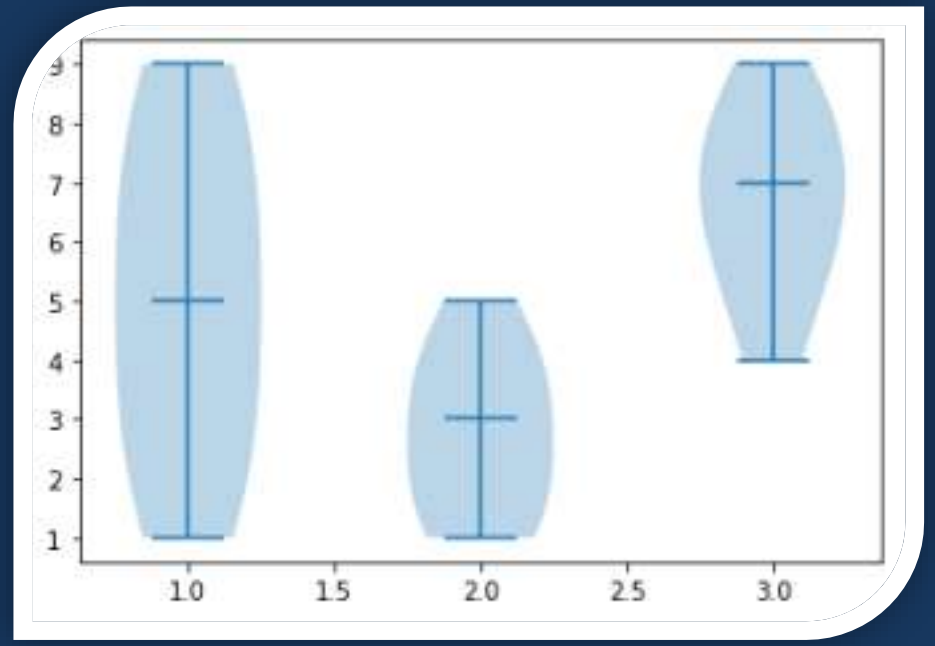
Violin-Plot

Creating data

```
one = [1,2,3,4,5,6,7,8,9]
two = [1,2,3,4,5,4,3,2,1]
three = [6,7,8,9,8,7,6,5,4]

data =  list([one,two,three])
```

Making Plot

```
plt.violinplot(data,showmedians=True)
plt.show()
```



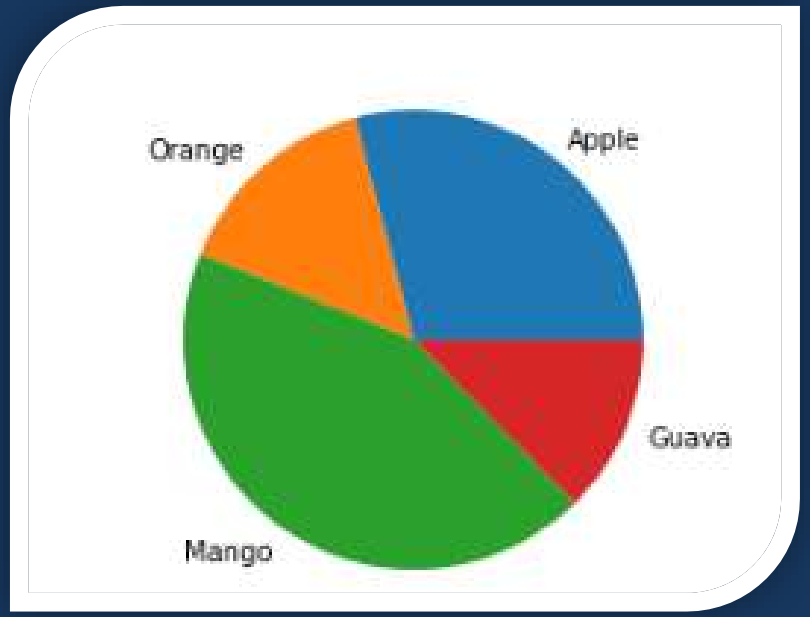
Pie-Chart

Creating data

```
fruit = ['Apple','Orange','Mango','Guava']
quantity = [67,34,100,29]
```

Making Plot

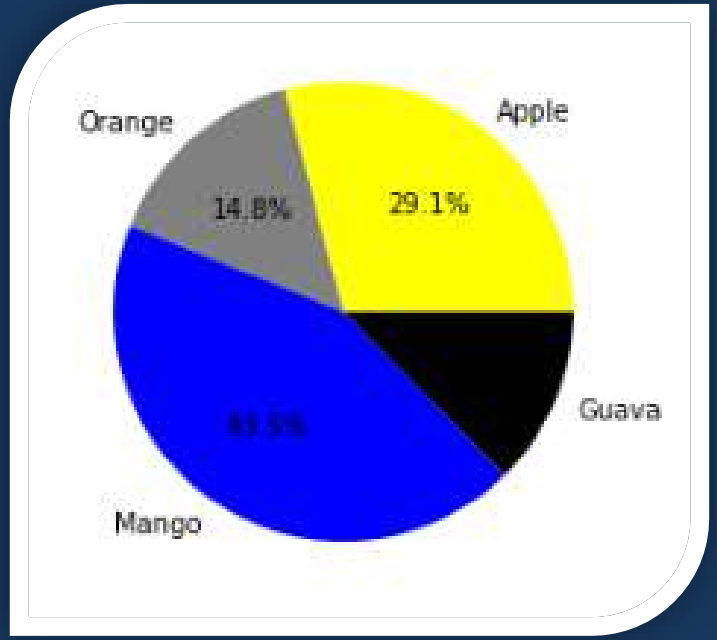
```
plt.pie(quantity,labels=fruit)
plt.show()
```



Pie-Chart

Changing Aesthetics

```
plt.pie(quantity,labels=fruit,autopct='%0.1f%%'
        ,colors=['yellow','grey','blue','black'])
plt.show()
```



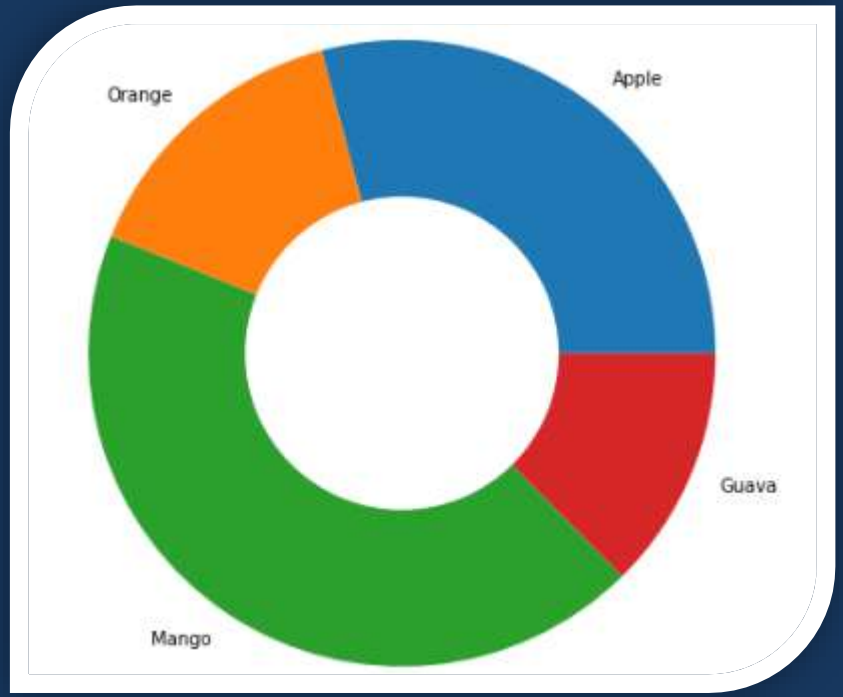
DoughNut-Chart

Creating Data

```
fruit = ['Apple','Orange','Mango','Guava']
quantity = [67,34,100,29]
```

Making Plot

```
plt.pie(quantity,labels=fruit,radius=2)
plt.pie([1],colors=['w'],radius=1)
plt.show()
```



SeaBorn Line Plot

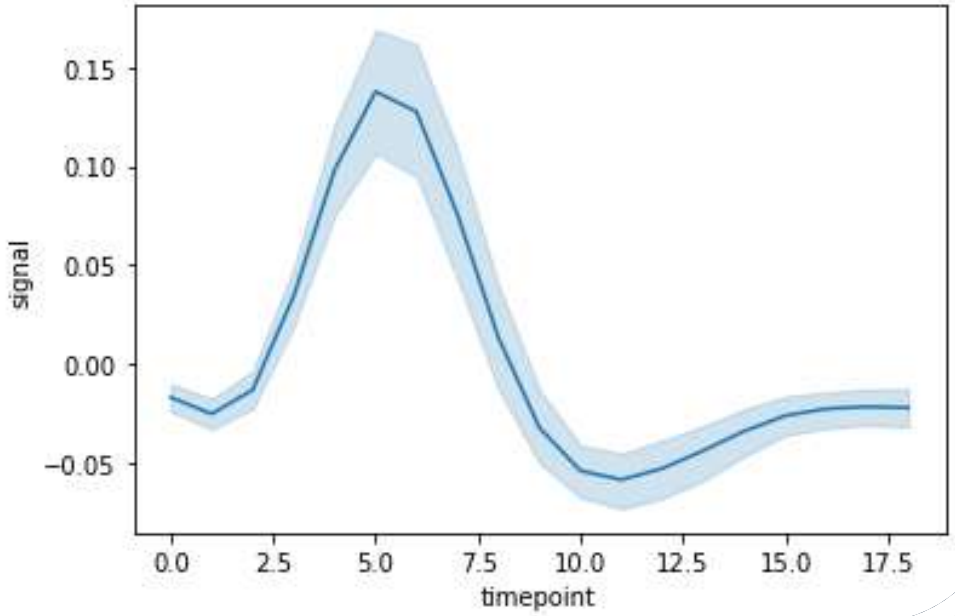
```
In [10]: import seaborn as sns
         from matplotlib import pyplot as plt
```

```
In [18]: fmri = sns.load_dataset("fmri")
         fmri.head()
```

Out[18]:

	subject	timepoint	event	region	signal
0	s13	18	stim	parietal	-0.017552
1	s5	14	stim	parietal	-0.080883
2	s12	18	stim	parietal	-0.081033
3	s11	18	stim	parietal	-0.046134
4	s10	18	stim	parietal	-0.037970

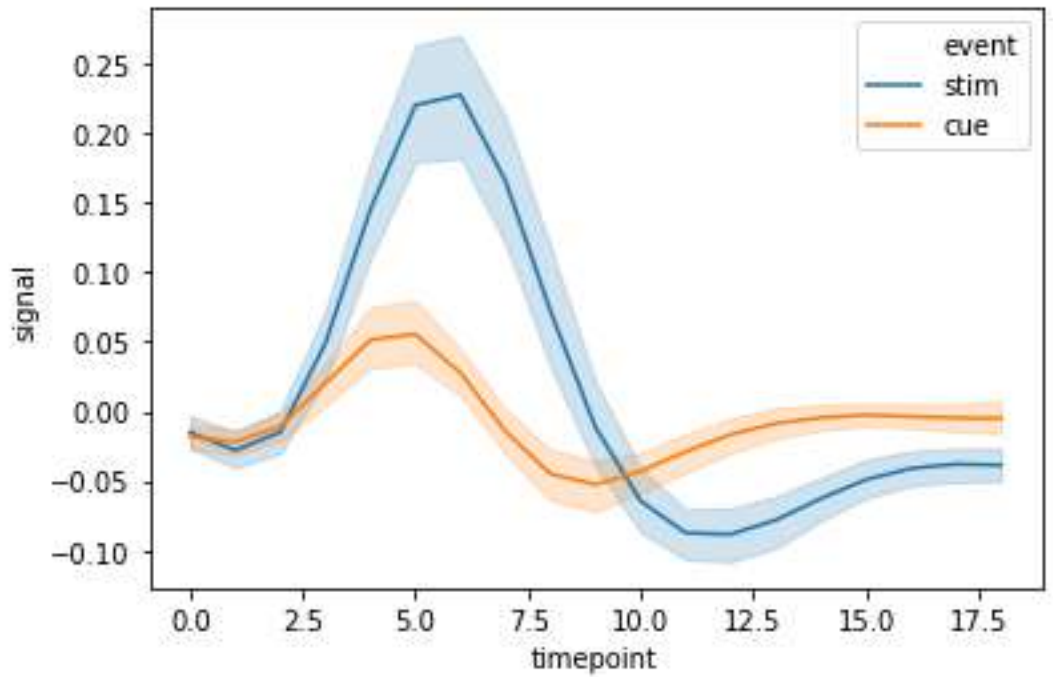
```
In [20]: sns.lineplot(x="timepoint", y="signal", data=fmri)
         plt.show()
```



SeaBorn Line Plot

Grouping data with ‘hue’

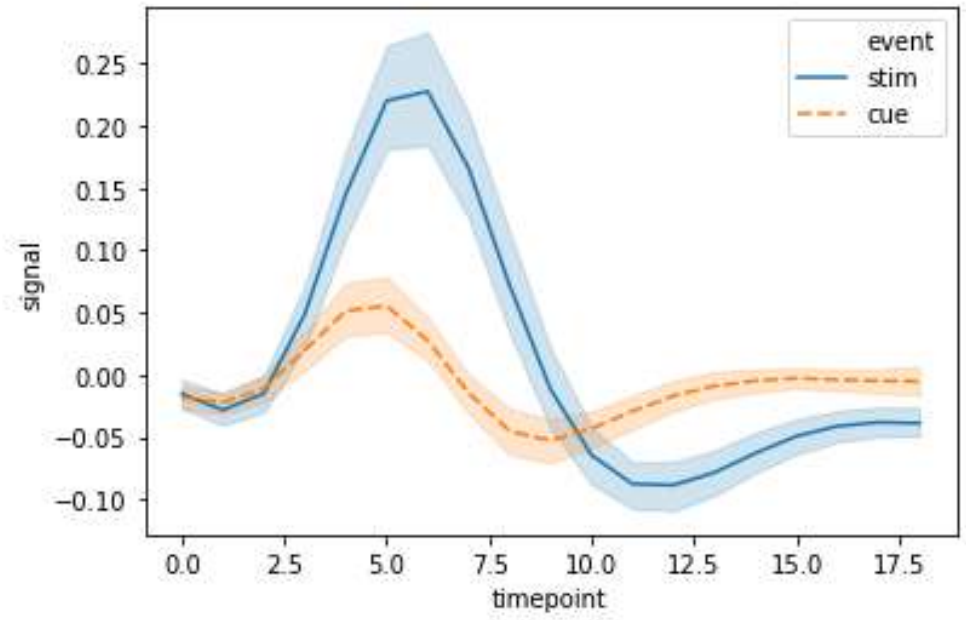
```
In [21]: sns.lineplot(x="timepoint", y="signal", data=fmri,hue="event")
         plt.show()
```



SeaBorn Line Plot

Adding Styles

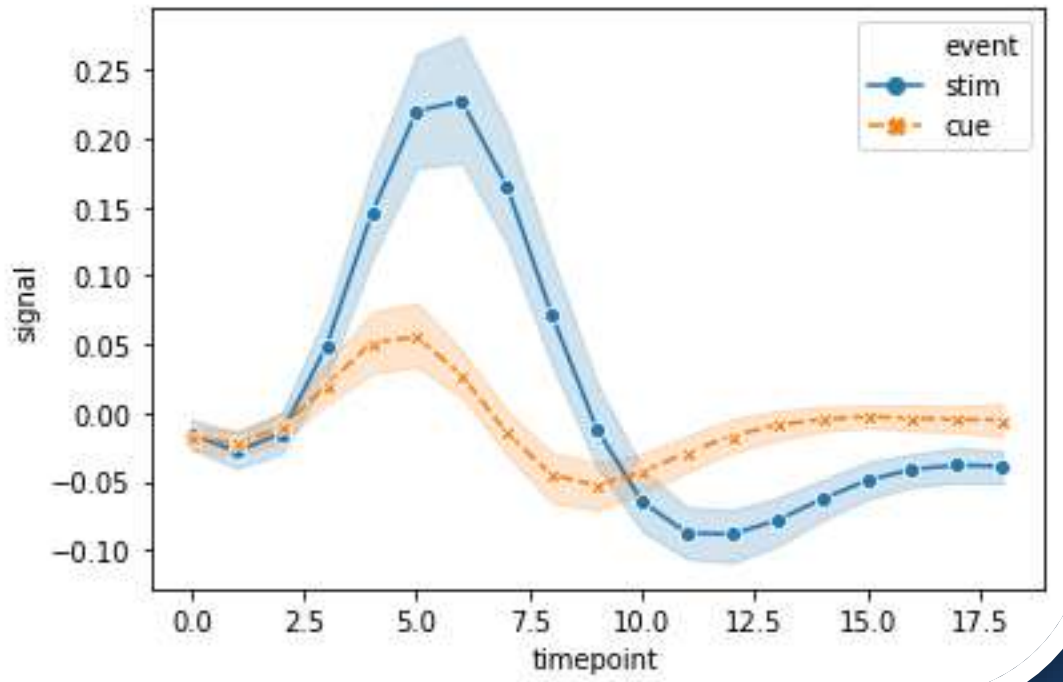
```
In [22]: sns.lineplot(x="timepoint", y="signal", data=fmri,hue="event",style="event")
         plt.show()
```



SeaBorn Line Plot

Adding Markers

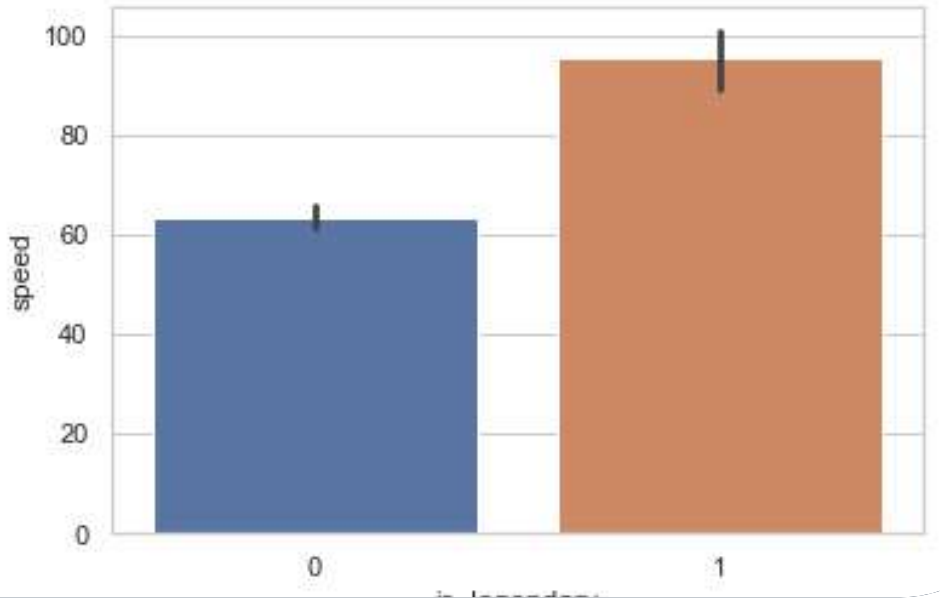
```
[24]: sns.lineplot(x="timepoint", y="signal",
                   hue="event", style="event",
                   markers=True, data=fmri)
plt.show()
```



SeaBorn Bar Plot

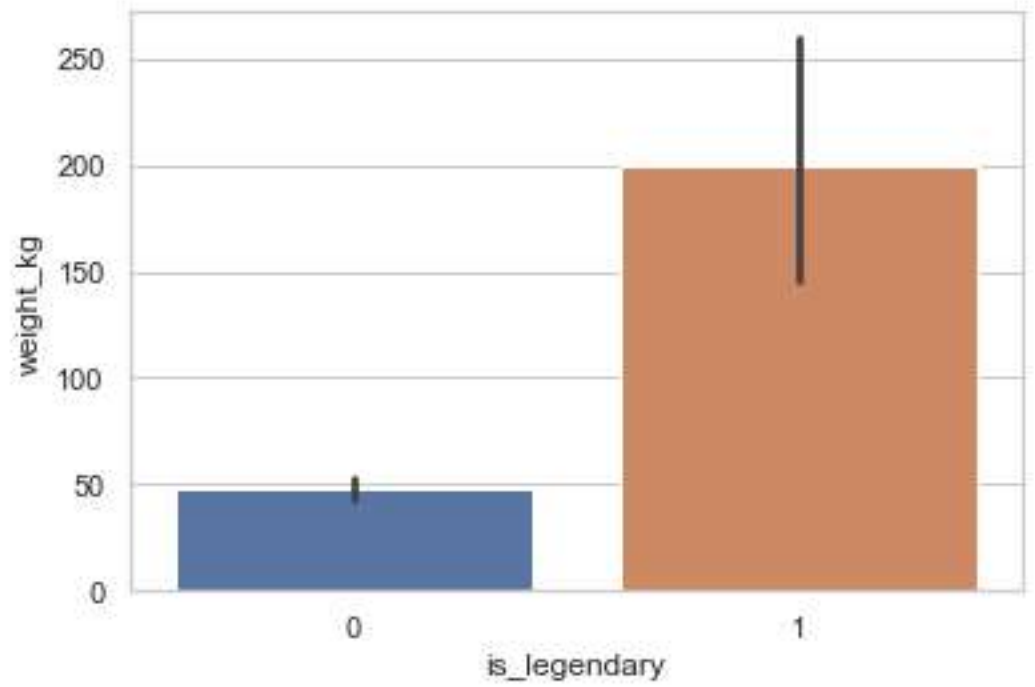
```
In [29]: import pandas as pd
         sns.set(style="whitegrid")
         pokemon=pd.read_csv('pokemon.csv')
```

```
In [31]: sns.barplot(x="is_legendary", y="speed", data=pokemon)
         plt.show()
```



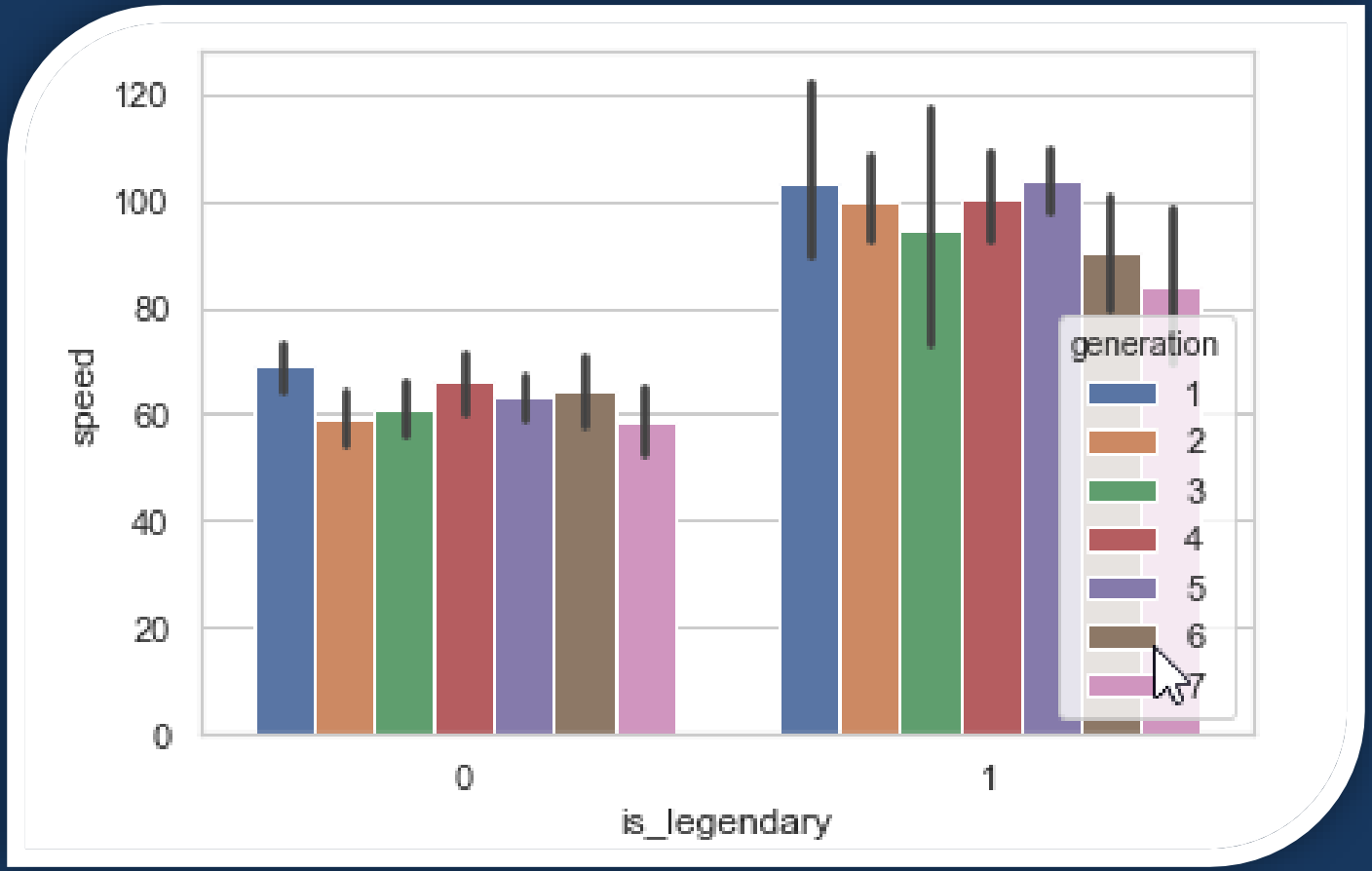
SeaBorn Bar Plot

```
n [43]: sns.barplot(x="is_legendary", y="weight_kg",data=pokemon)
        plt.show()
```



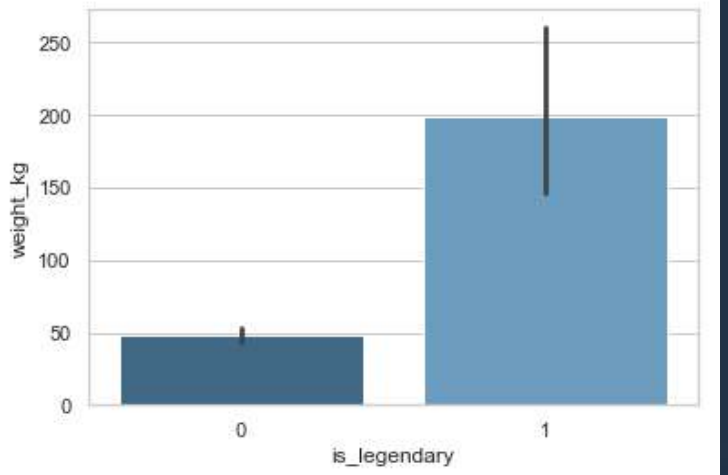
SeaBorn Bar Plot

```
In [32]: sns.barplot(x="is_legendary", y="speed", hue="generation",data=pokemon)
         plt.show()
```

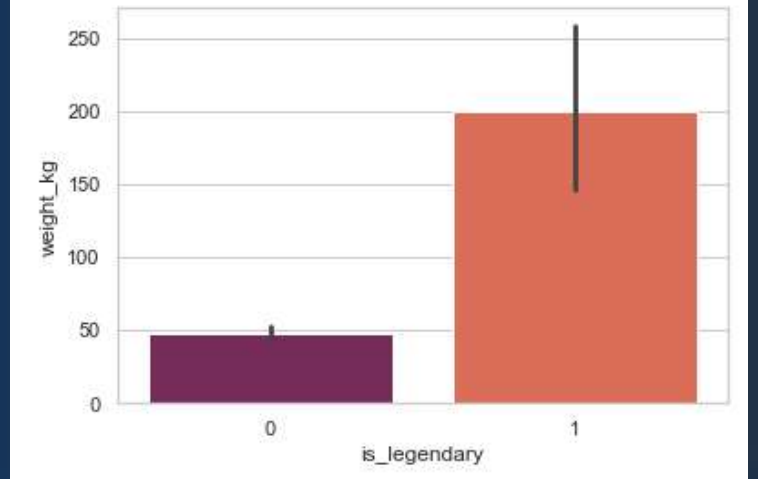


SeaBorn Bar Plot

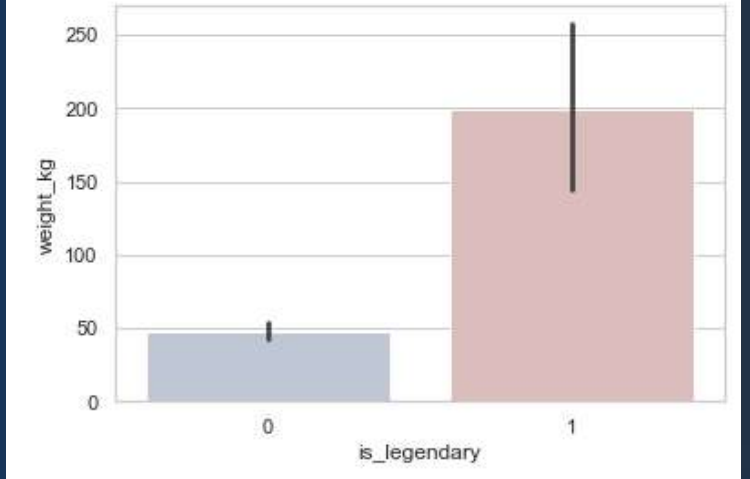
```
sns.barplot(x="is_legendary", y="weight_kg",
            data=pokemon,palette='Blues_d')
plt.show()
```




```
sns.barplot(x="is_legendary", y="weight_kg",
            data=pokemon,palette='rocket')
plt.show()
```

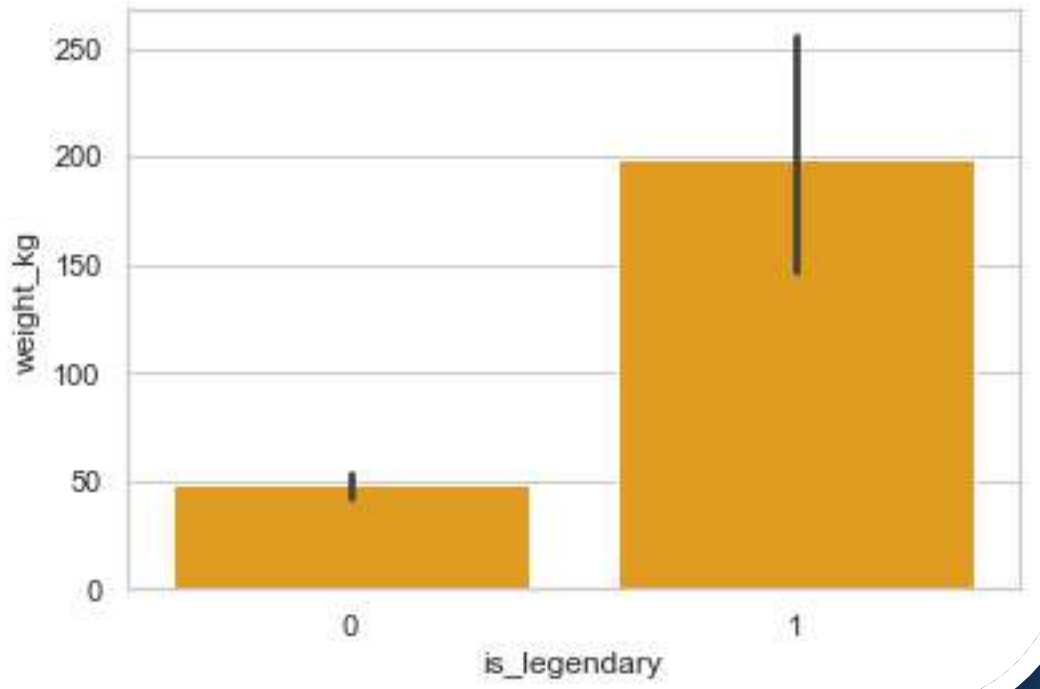



```
sns.barplot(x="is_legendary", y="weight_kg",
            data=pokemon,palette='vlag')
plt.show()
```



SeaBorn Bar Plot

```
n [50]: sns.barplot(x="is_legendary", y="weight_kg",
                    data=pokemon,color="orange")
        plt.show()
```

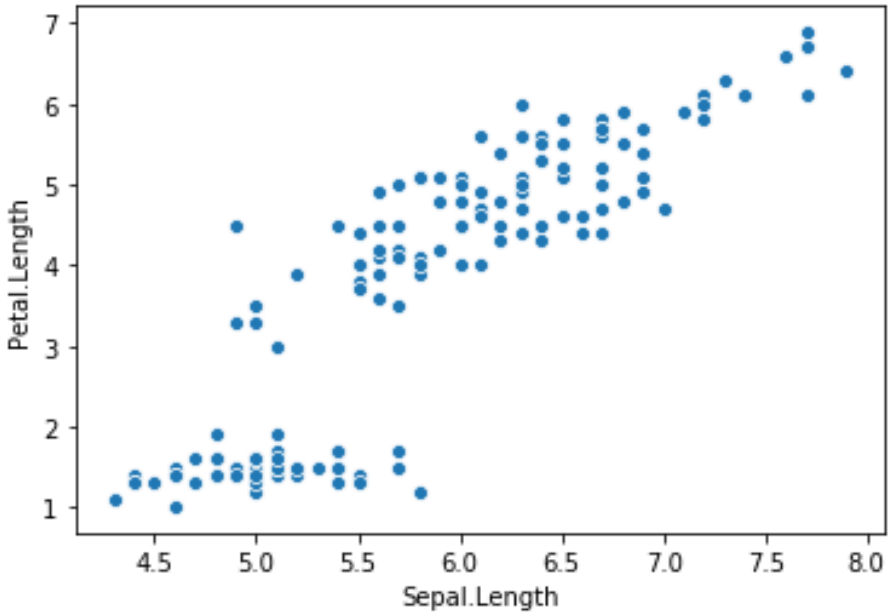


SeaBorn Scatterplot

```
In [5]: iris = pd.read_csv('iris.csv')
        iris.head()
```

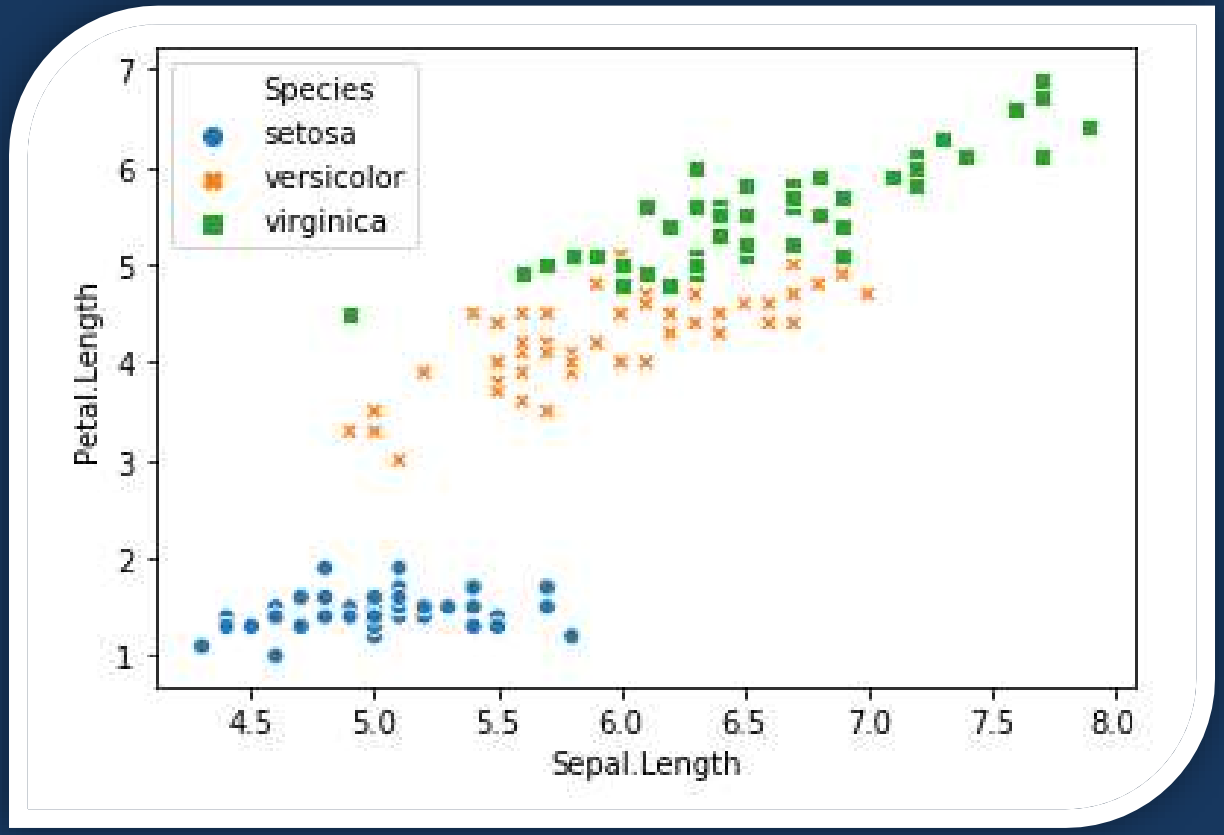
	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

```
sns.scatterplot(x="Sepal.Length", y="Petal.Length", data=iris)
plt.show()
```



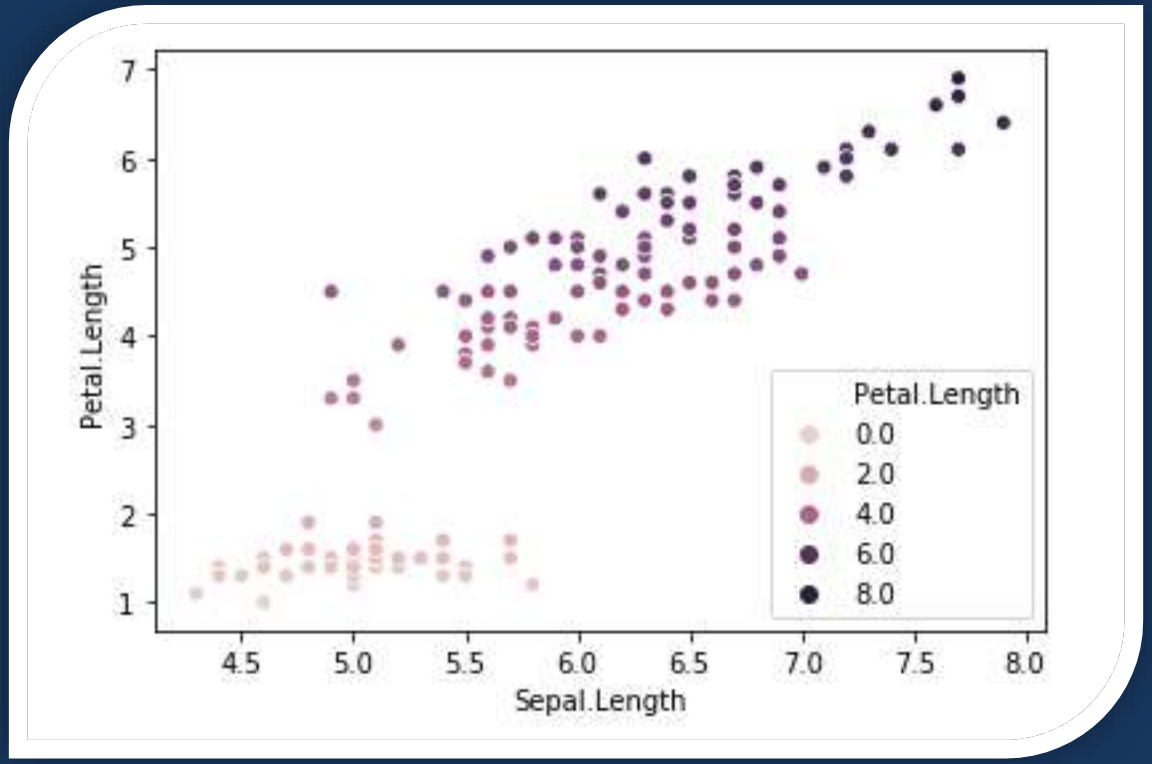
SeaBorn Scatterplot

```
sns.scatterplot(x="Sepal.Length", y="Petal.Length", data=iris,hue="Species",style="Species")
plt.show()
```



SeaBorn Scatterplot

```
sns.scatterplot(x='Sepal.Length',y='Petal.Length',data=iris,hue='Petal.Length')
```

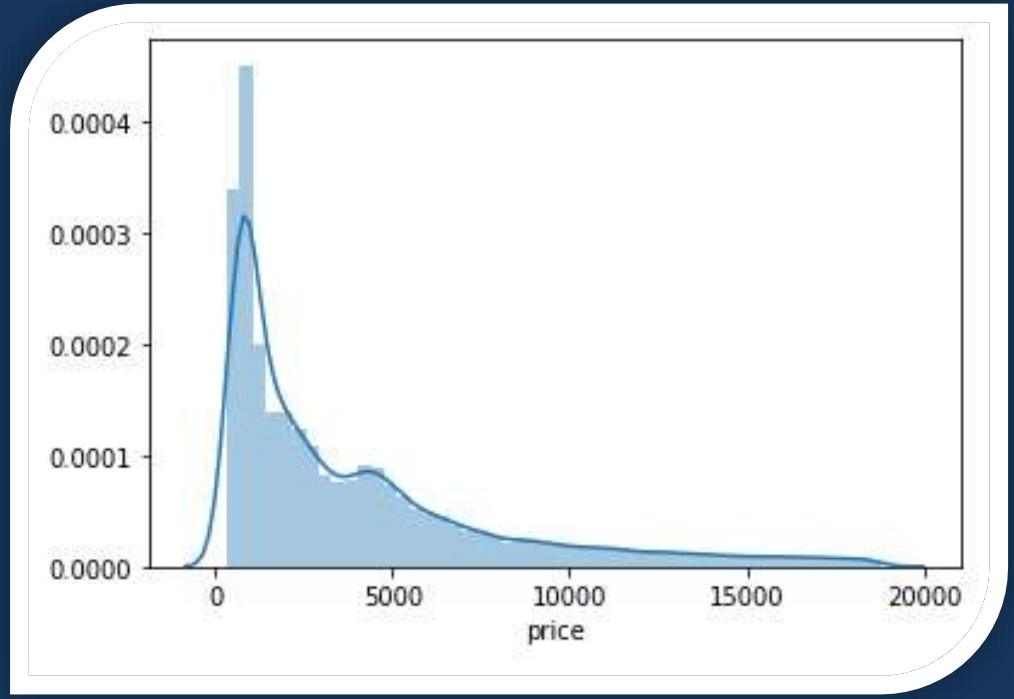


SeaBorn Histogram/Distplot

```
diamonds = pd.read_csv('diamonds.csv')
diamonds.head()
```

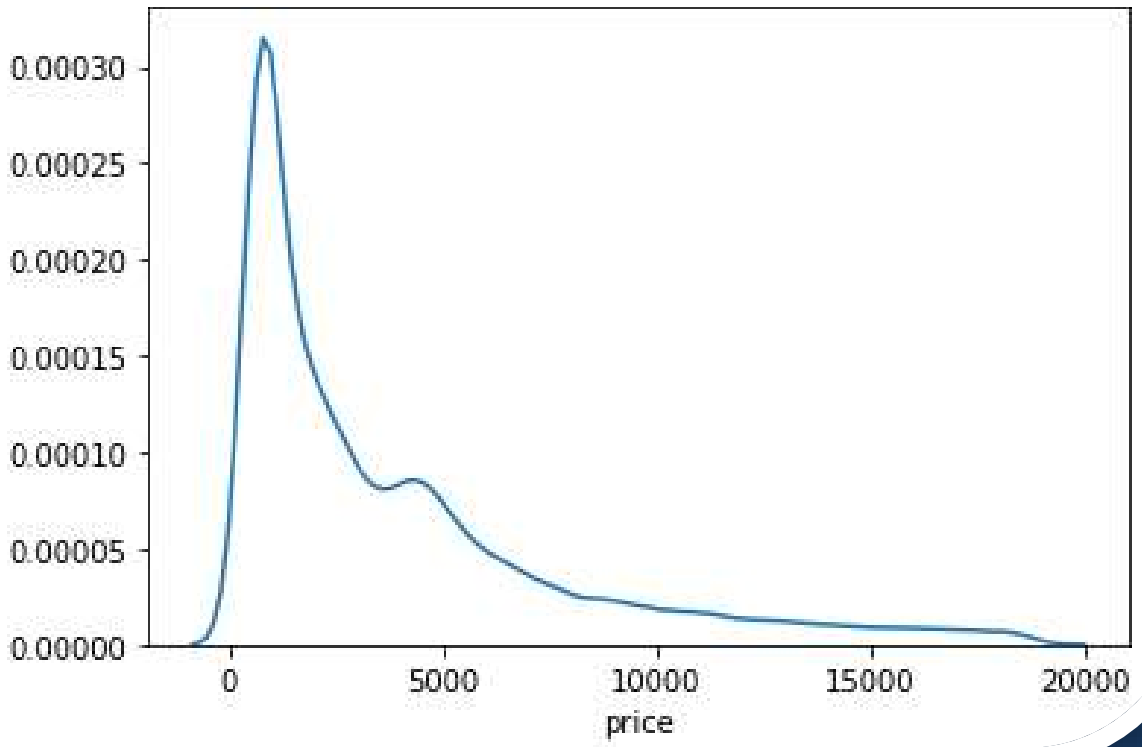
	carat	cut	color	clarity	depth	table	price	x	y	z
0	0.23	Ideal	E	SI2	61.5	55.0	326	3.95	3.98	2.43
1	0.21	Premium	E	SI1	59.8	61.0	326	3.89	3.84	2.31
2	0.23	Good	E	VS1	56.9	65.0	327	4.05	4.07	2.31
3	0.29	Premium	I	VS2	62.4	58.0	334	4.20	4.23	2.63
4	0.31	Good	J	SI2	63.3	58.0	335	4.34	4.35	2.75

```
sns.distplot(diamonds['price'])
plt.show()
```



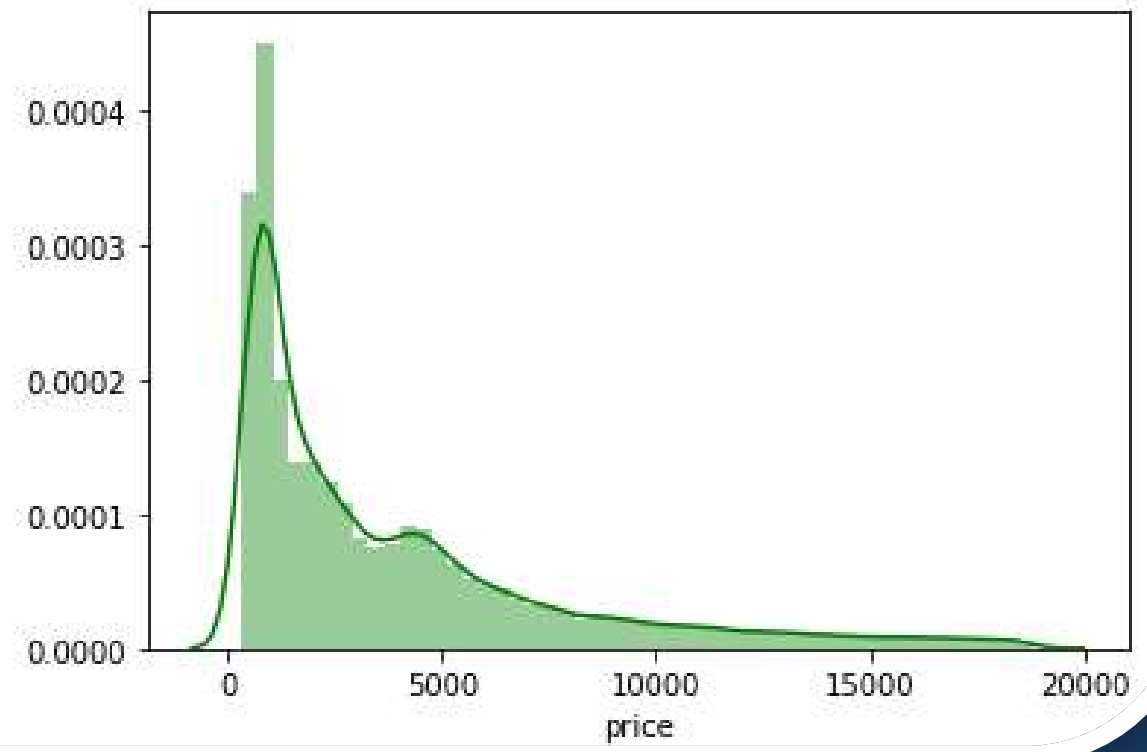
SeaBorn Histogram/Distplot

```
sns.distplot(diamonds['price'],hist=False)
plt.show()
```



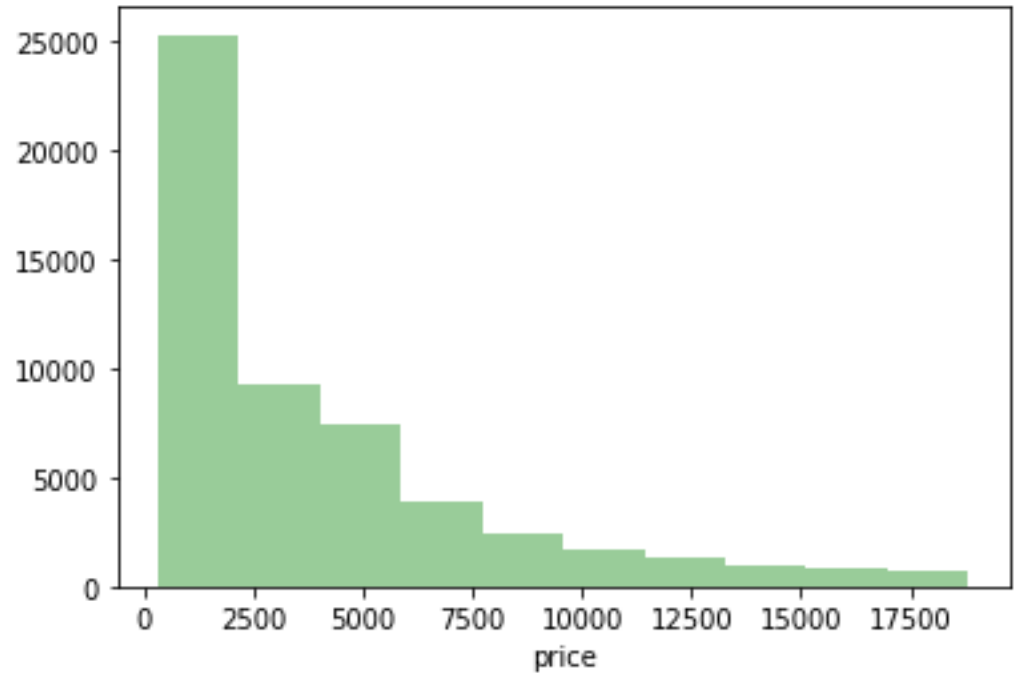
SeaBorn Histogram/Distplot

```
sns.distplot(diamonds['price'],color="green")
plt.show()
```



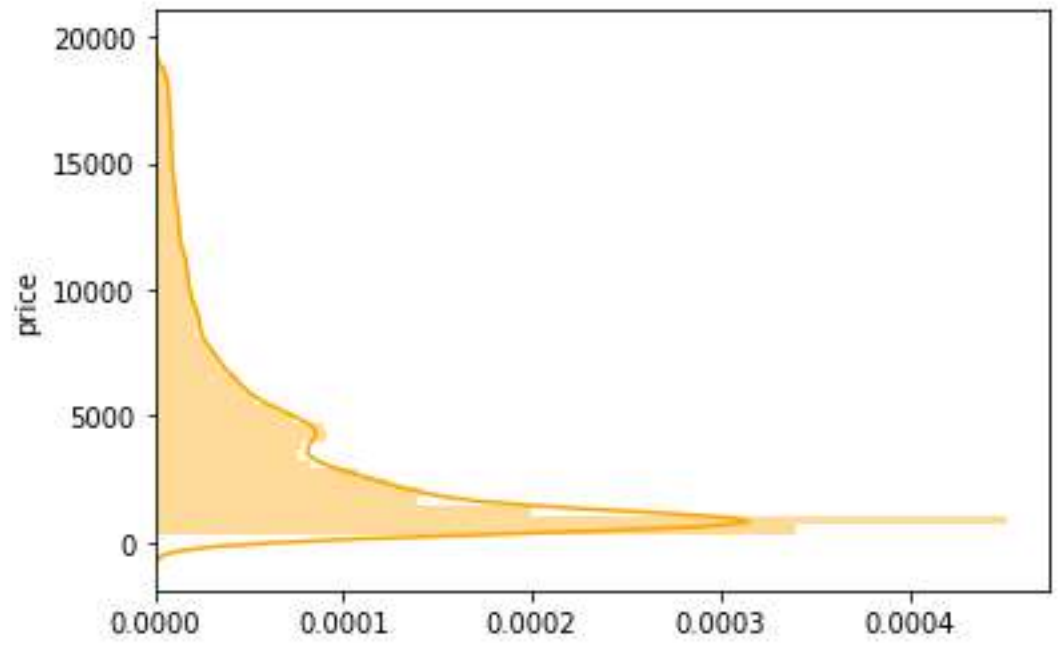
SeaBorn Histogram/Distplot

```
sns.distplot(diamonds['price'],color="green",bins=10,kde=False)
plt.show()
```



SeaBorn Histogram/Distplot

```
sns.distplot(diamonds['price'],color="orange",vertical=True)
plt.show()
```

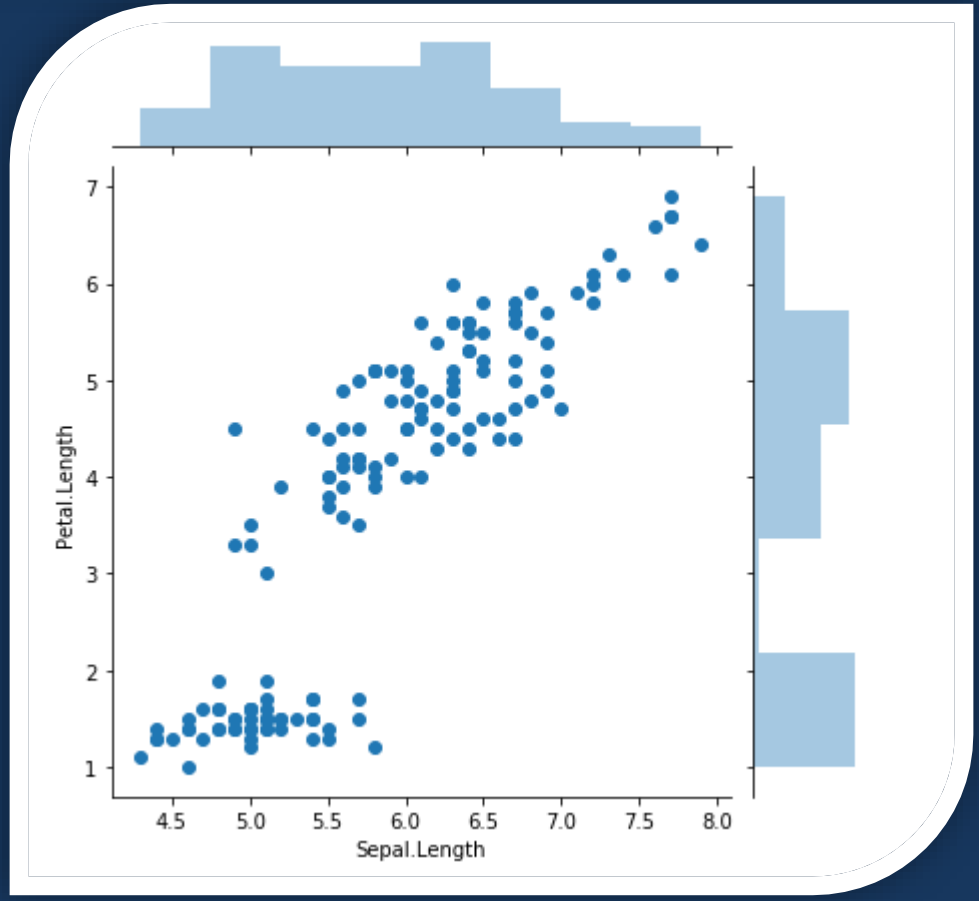


SeaBorn JointPlot

```
In [5]: iris = pd.read_csv('iris.csv')
        iris.head()
```

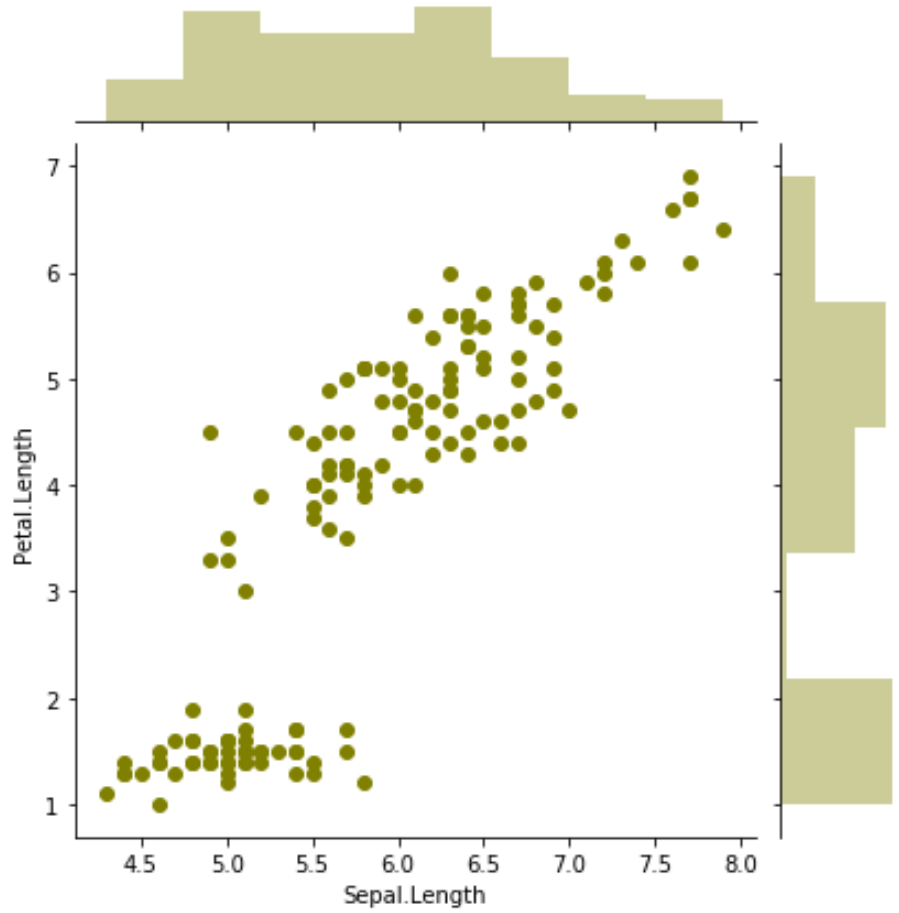
	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

```
sns.jointplot(x='Sepal.Length',y='Petal.Length',data=iris)
plt.show()
```



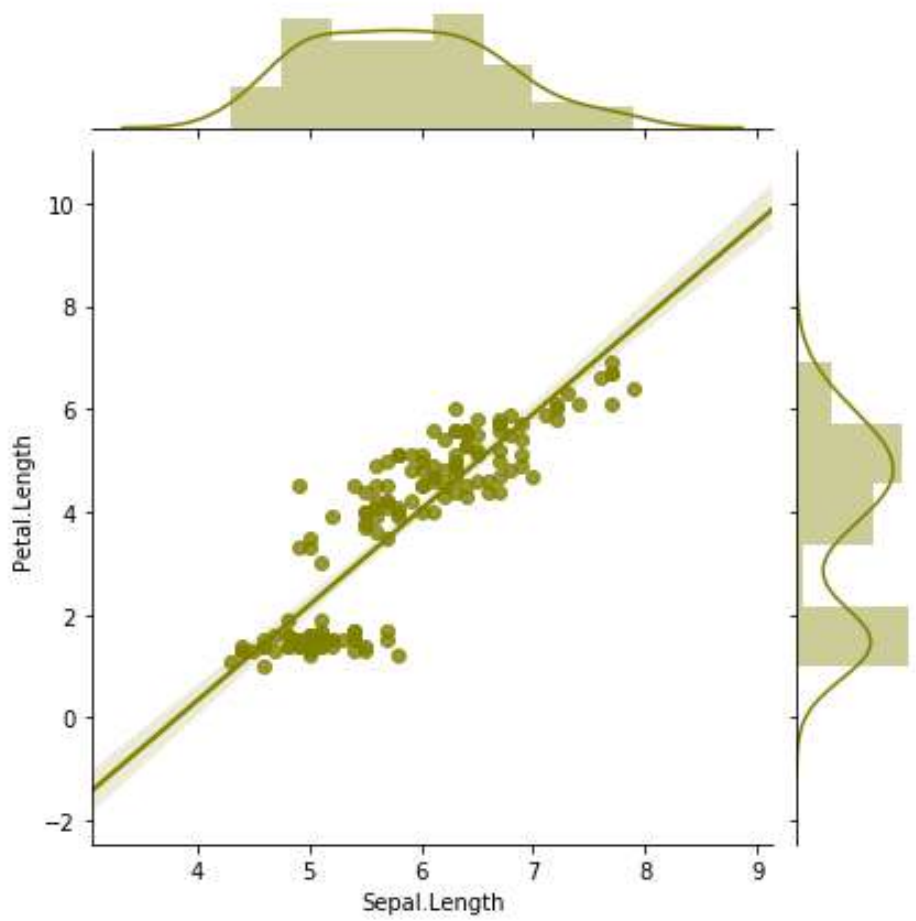
SeaBorn JointPlot

```
[62]: sns.jointplot(x='Sepal.Length',y='Petal.Length',data=iris,color="olive")
plt.show()
```



SeaBorn JointPlot

```
s.jointplot(x='Sepal.Length',y='Petal.Length',data=iris,color="olive",kind="reg")
plt.show()
```

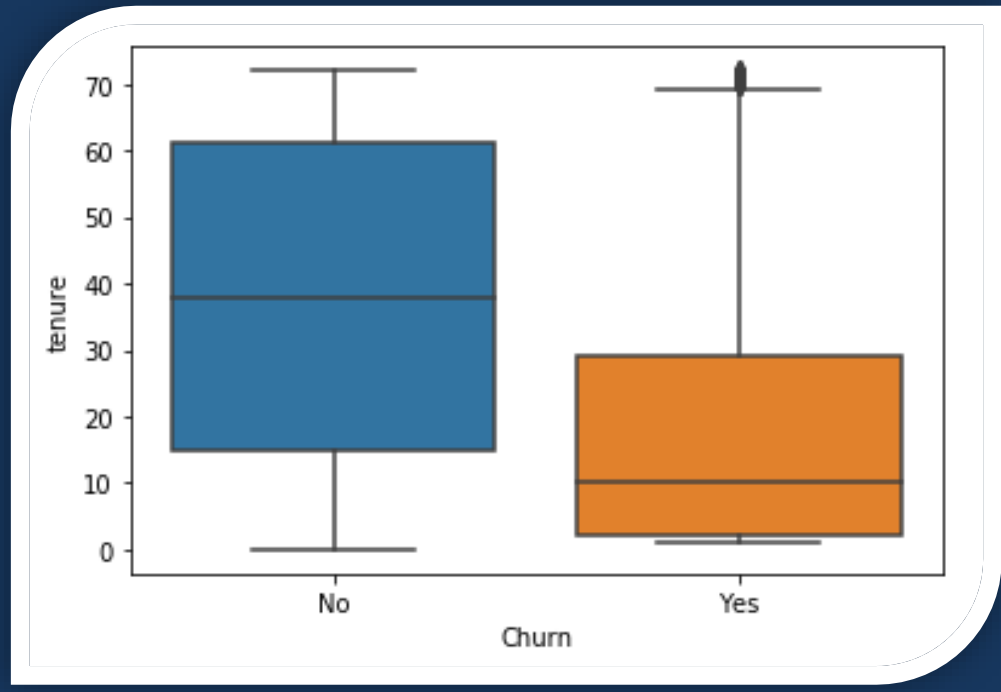


SeaBorn BoxPlot

```
churn = pd.read_csv('churn.csv')
churn.head()
```

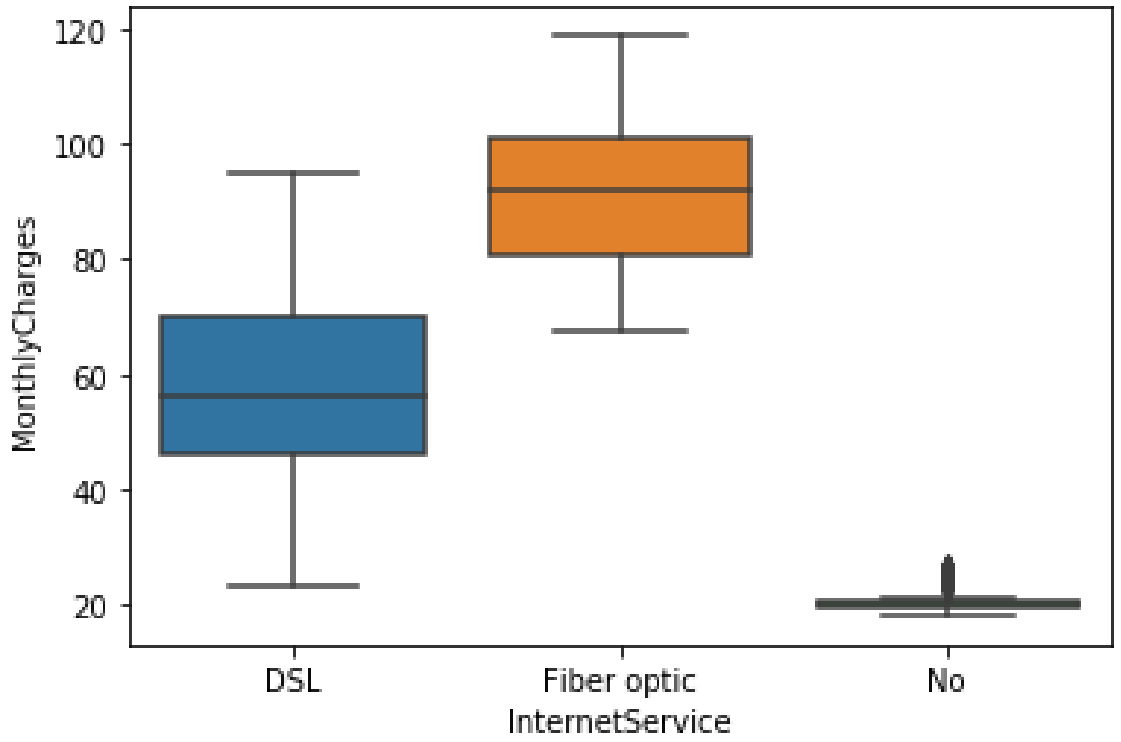
ustomerID	gender	SeniorCitizen	Partner	Dependents	tenure
7590-VHVEG	Female	0	Yes	No	1
5575-GNVDE	Male	0	No	No	34
3668-QPYBK	Male	0	No	No	2
7795-CFOCW	Male	0	No	No	45
9237-HQITU	Female	0	No	No	2

```
sns.boxplot(x='Churn',y='tenure',data=churn)
plt.show()
```



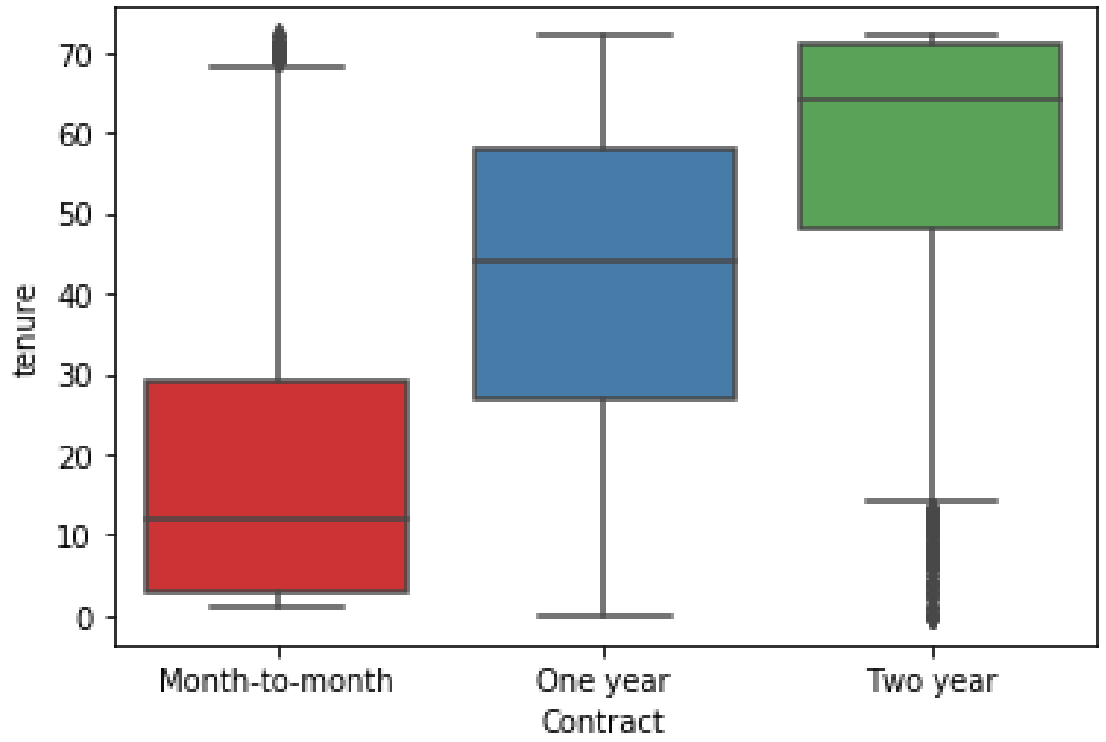
SeaBorn BoxPlot

```
sns.boxplot(x='InternetService',y='MonthlyCharges',data=churn)
plt.show()
```



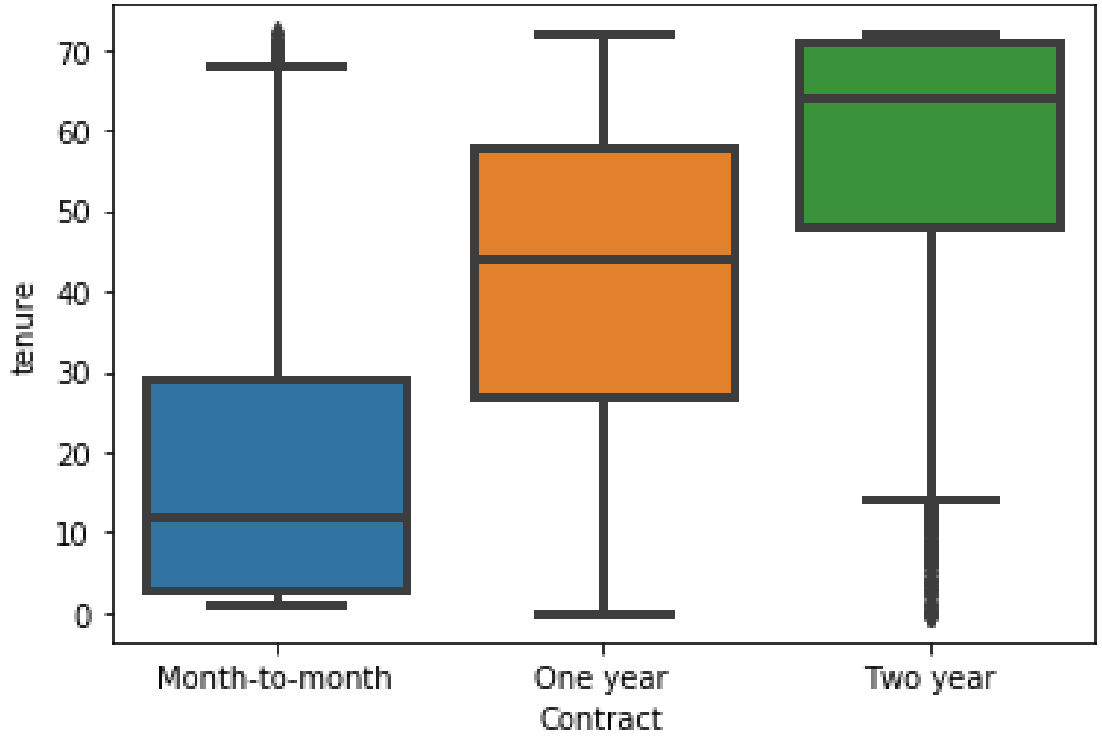
SeaBorn BoxPlot

```
sns.boxplot(x='Contract',y='tenure',data=churn,palette="Set1")
plt.show()
```



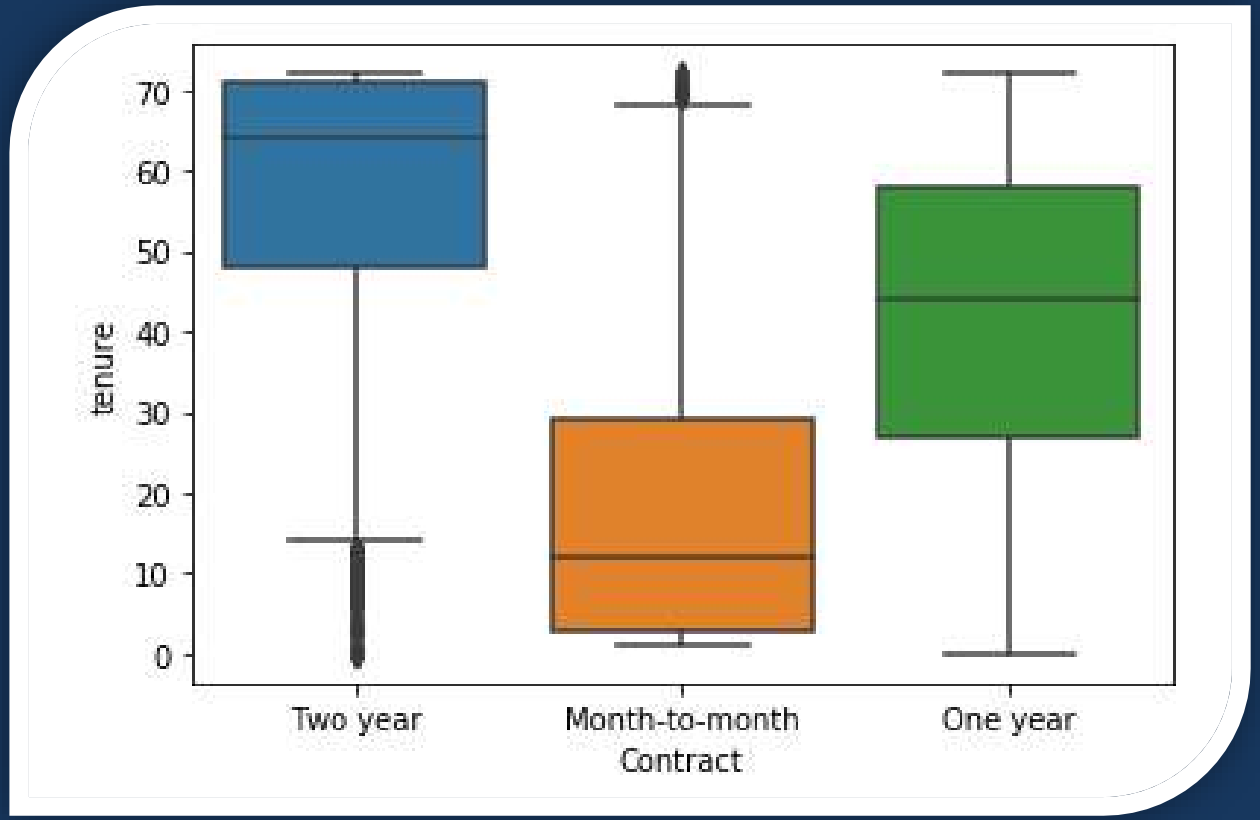
SeaBorn BoxPlot

```
sns.boxplot(x='Contract',y='tenure',data=churn,linewidth=3)
plt.show()
```



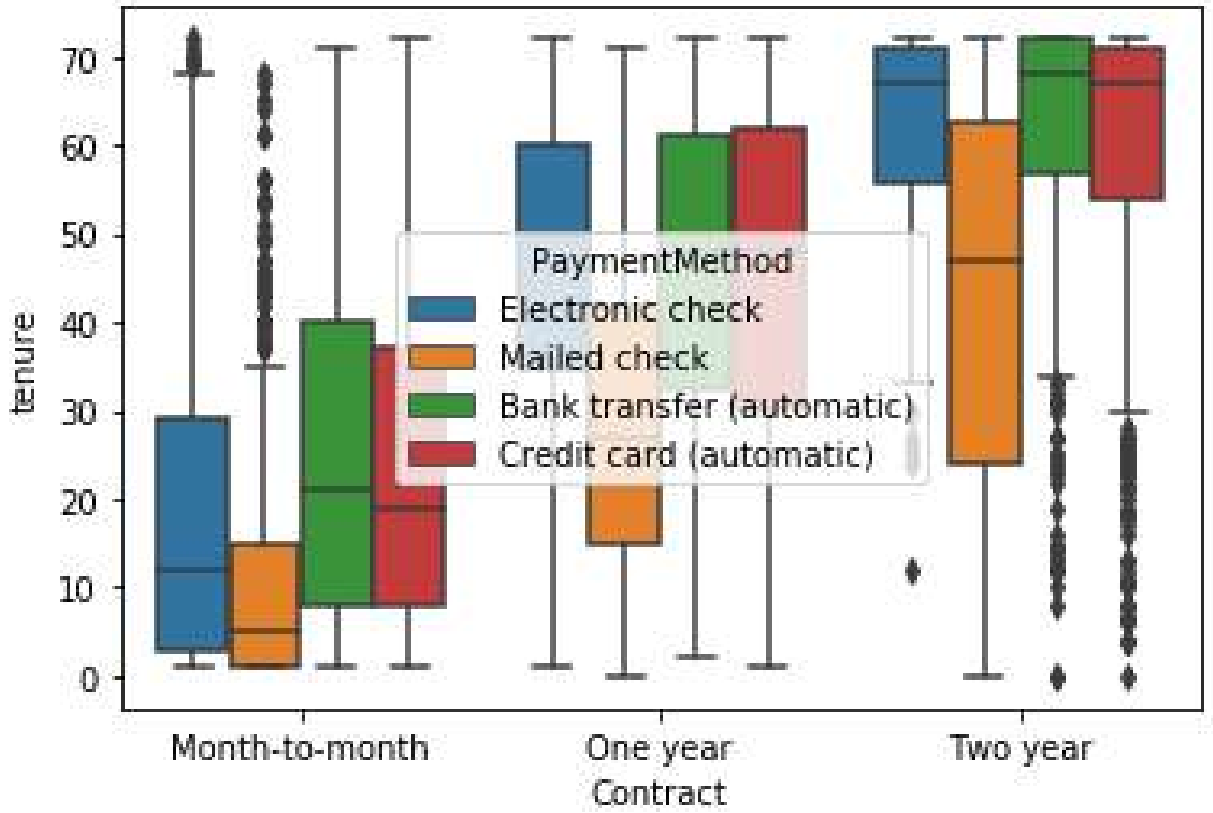
SeaBorn BoxPlot

```
sns.boxplot(x='Contract',y='tenure',data=churn,order=["Two year","Month-to-month","One year"])
plt.show()
```



SeaBorn BoxPlot

```
sns.boxplot(x='Contract',y='tenure',data=churn,hue="PaymentMethod")
plt.show()
```



SeaBorn Pair Plot

```
df = sns.load_dataset("iris")
sns.pairplot(df, hue="species")
plt.show()
```