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Graphics in Python

Libraries:

pandas

matplotlib

seaborn

Graphics Packages

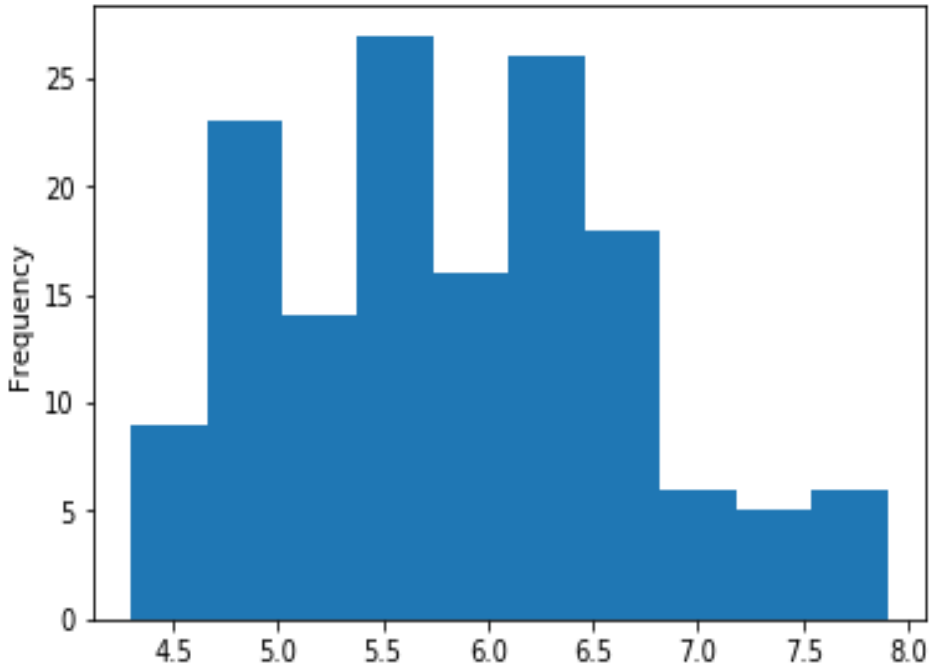
- The graphs can be created with the help of packages:
  - Pandas
  - Matplotlib
  - Seaborn

Graphs using pandas

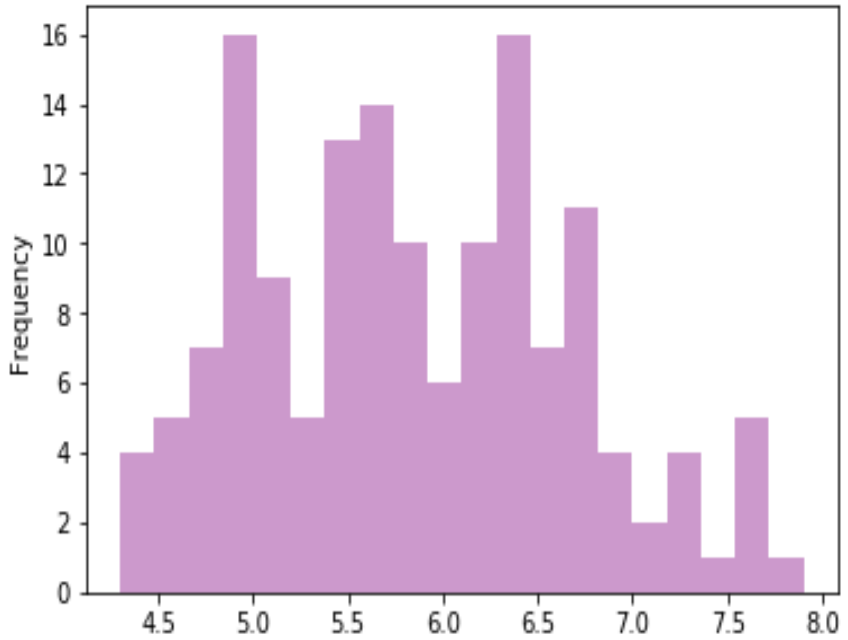
- pandas has a plot method to which we can pass the argument kind=
- kind : str
  - ‘line’ : line plot (default)
  - ‘bar’ : vertical bar plot
  - ‘barh’ : horizontal bar plot
  - ‘hist’ : histogram
  - ‘box’ : boxplot
  - ‘kde’ : Kernel Density Estimation plot
  - ‘density’ : same as ‘kde’
  - ‘area’ : area plot
  - ‘pie’ : pie plot

Histogram

```
In [8]: iris['Sepal.Length'].plot(kind='hist')
   ...: plt.show()
```




```
In [19]:
iris['Sepal.Length'].plot(kind='hist',color="purple",alpha=0.4,bins=20)
    ...: plt.show()
```



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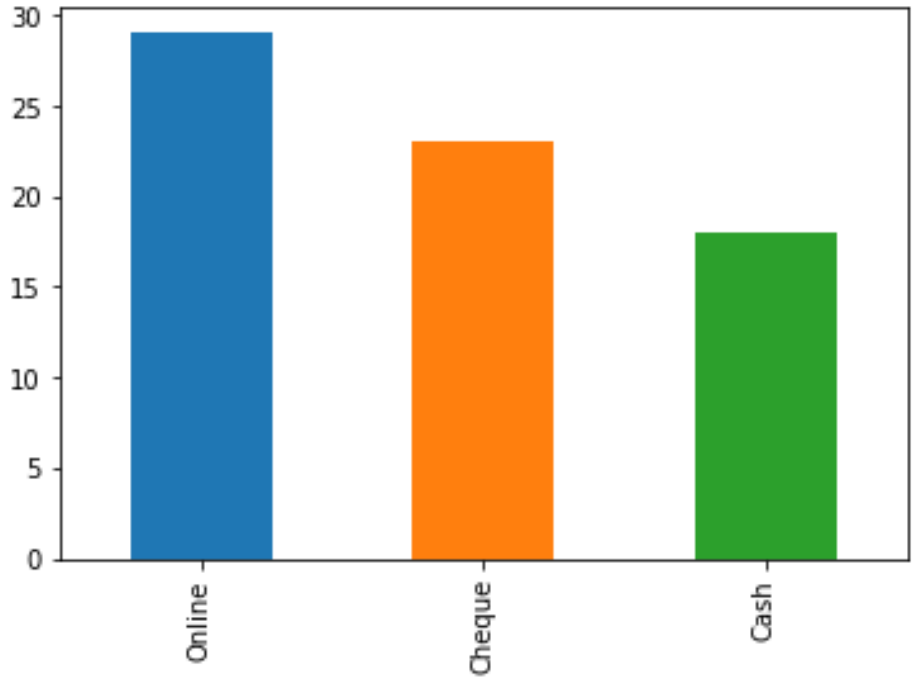
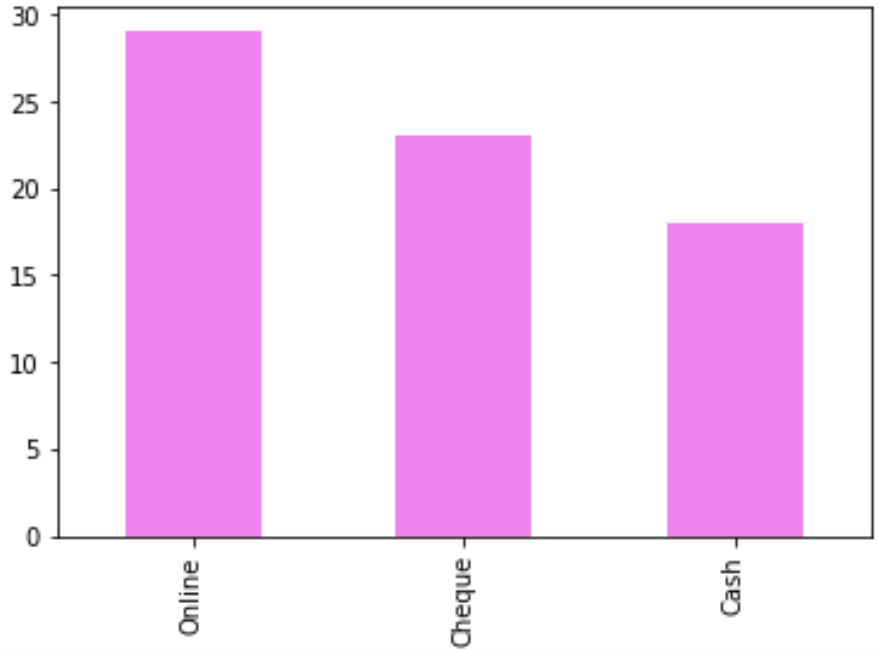
Bar Chart

```
In [21]: cts = Orders['Payment Terms'].value_counts()
    ...: cts.plot(kind='bar')
    ...: plt.show()
```




```
In [24]: cts = Orders['Payment Terms'].value_counts()
    ...: cts.plot(kind='bar', color="violet")
    ...: plt.show()
```



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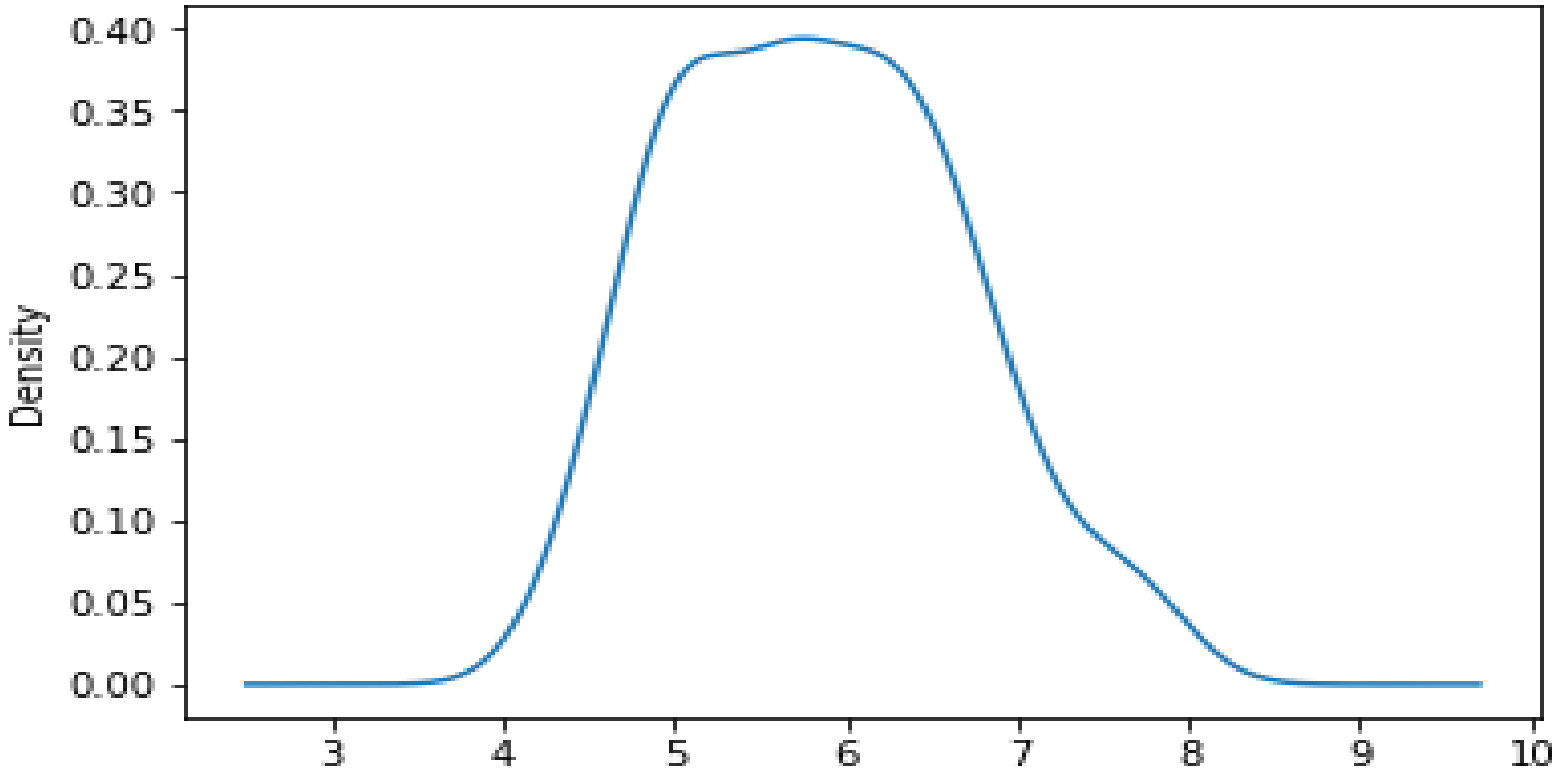
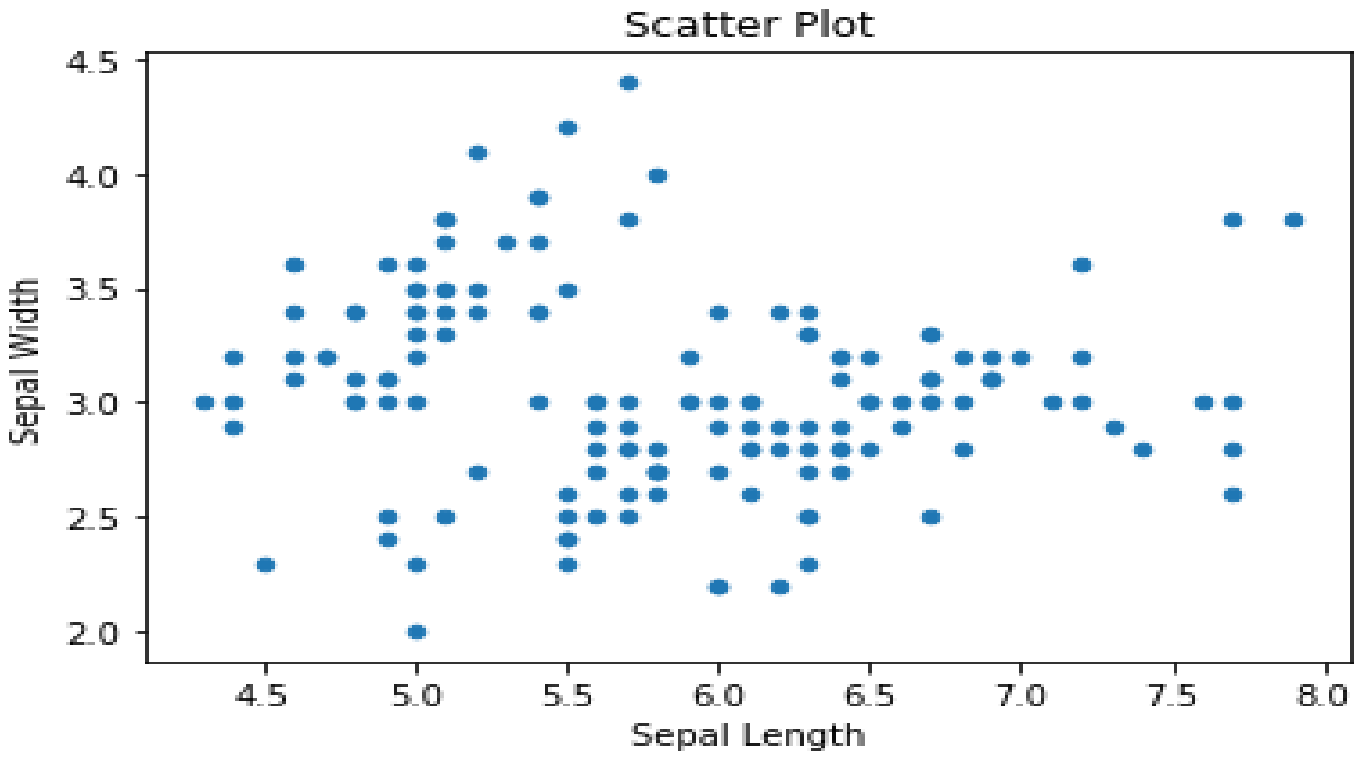
Density Plot

```
In [28]: iris['Sepal.Length'].plot(kind='kde')
    ...: plt.show()
```



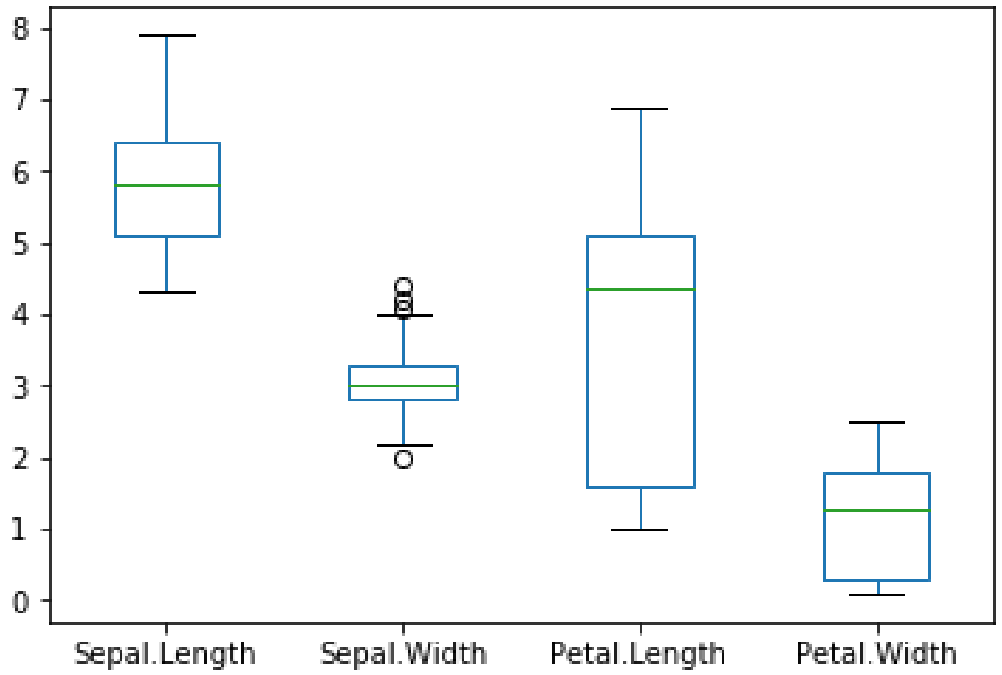
Scatter Plot

```
In [33]: iris.plot(kind='scatter', x='Sepal.Length', y='Sepal.Width')
    ...: plt.xlabel("Sepal Length")
    ...: plt.ylabel("Sepal Width")
    ...: plt.title("Scatter Plot")
    ...: plt.show()
```

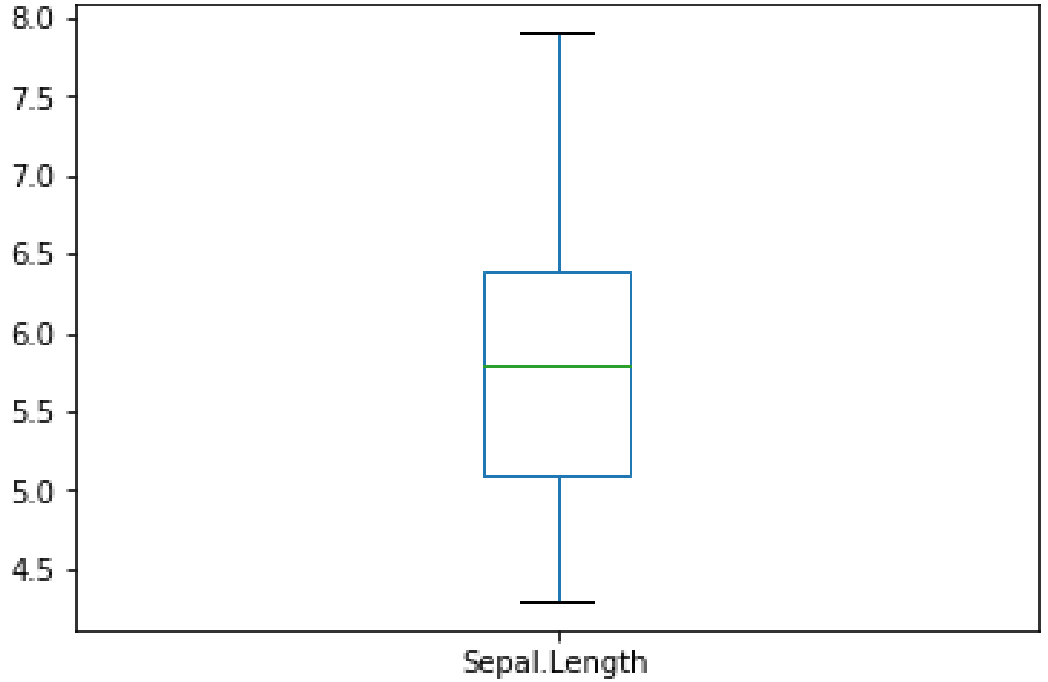


Boxplot

```
In [34]: iris.plot(kind='box')
    ...: plt.show()
```




```
In [39]: iris['Sepal.Length'].plot(kind='box')
    ...: plt.show()
```



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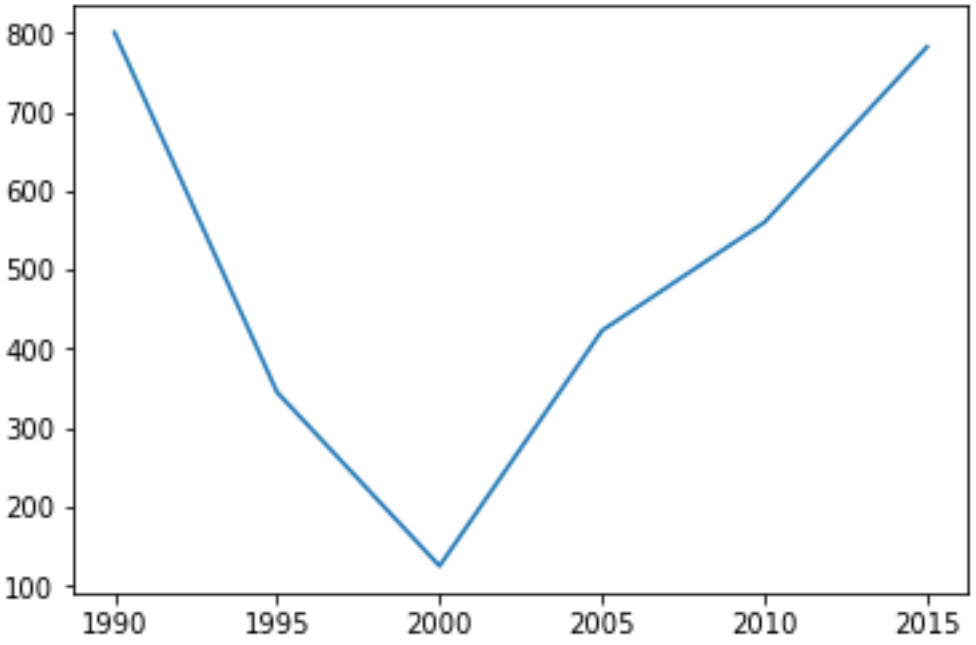
Library matplotlib

- matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms
- matplotlib tries to make easy things easy and hard things possible. You can generate plots, histograms, power spectra, bar charts, errorcharts, scatterplots, etc., with just a few lines of code.

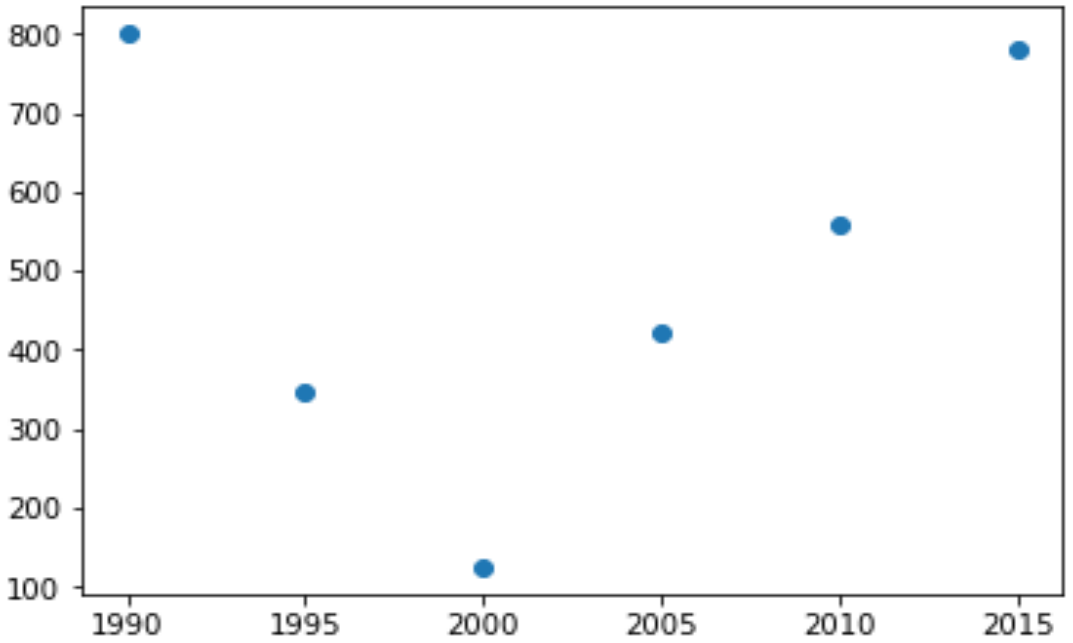
Line Plot

```
import matplotlib.pyplot as plt
x = [1990,1995,2000,2005,2010,2015]
y = [800,345,125,423,560,782]
plt.plot(x,y)
plt.show()
```



Scatter Plot

```
import matplotlib.pyplot as plt
x = [1990,1995,2000,2005,2010,2015]
y = [800,345,125,423,560,782]
plt.scatter(x,y)
plt.show()
```



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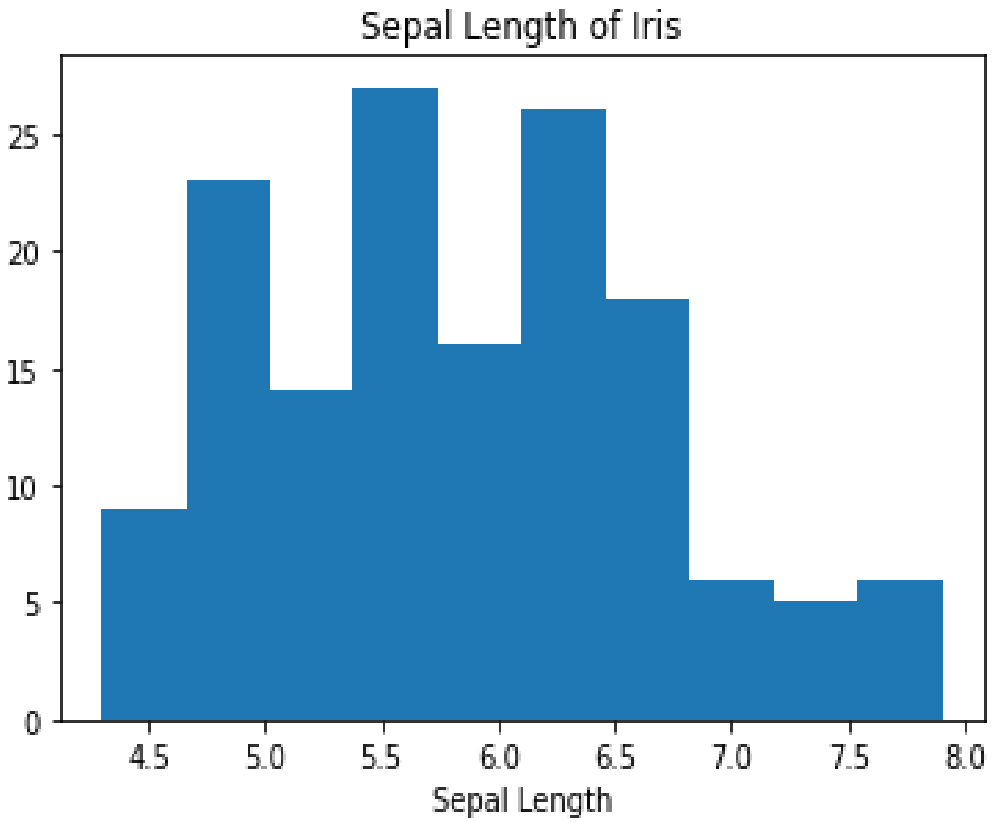
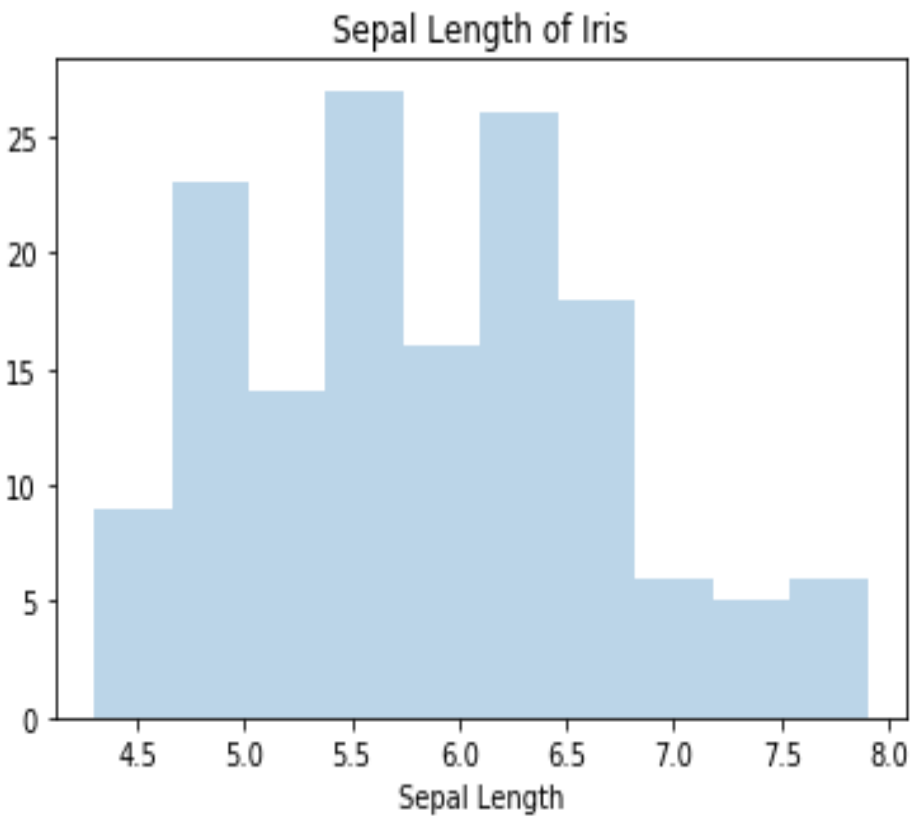
Histogram

```
In [40]: plt.hist(iris['Sepal.Length'] , bins=10)
    ...: plt.xlabel("Sepal Length")
    ...: plt.title("Sepal Length of Iris")
    ...: plt.show()
```

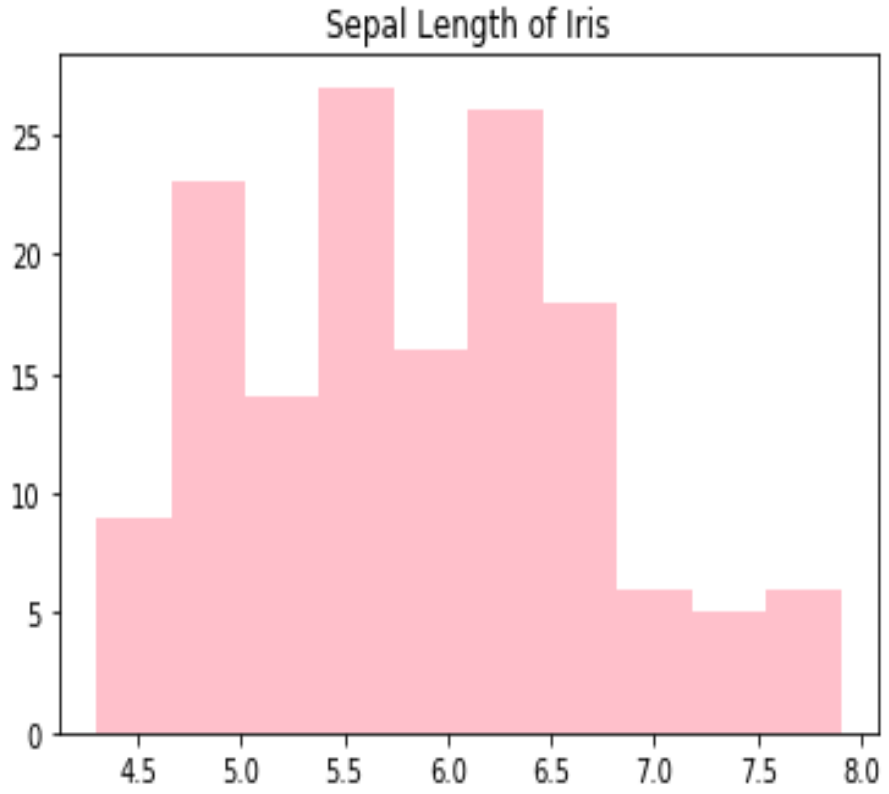



```
In [42]: plt.hist(iris['Sepal.Length'] , bins=10, alpha=0.3)
    ...: plt.xlabel("Sepal Length")
    ...: plt.title("Sepal Length of Iris")
    ...: plt.show()
```

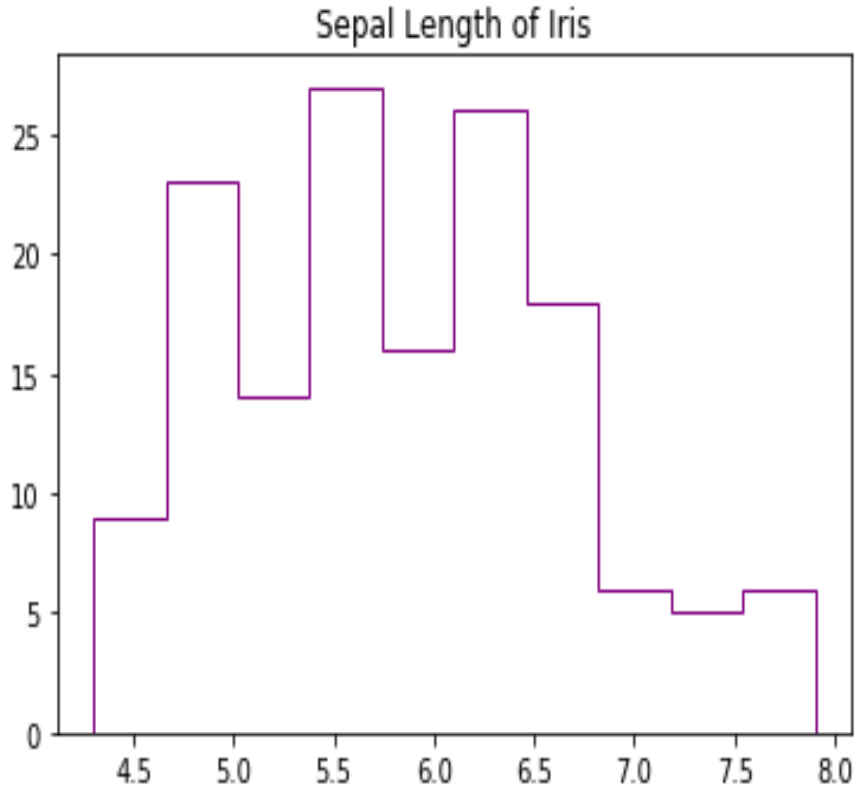


Histogram

```
In [19]: plt.hist(iris['Sepal.Length'],color='pink')
    ...: plt.title("Sepal Length of Iris")
Out[19]: Text(0.5,1,'Sepal Length of Iris')
```

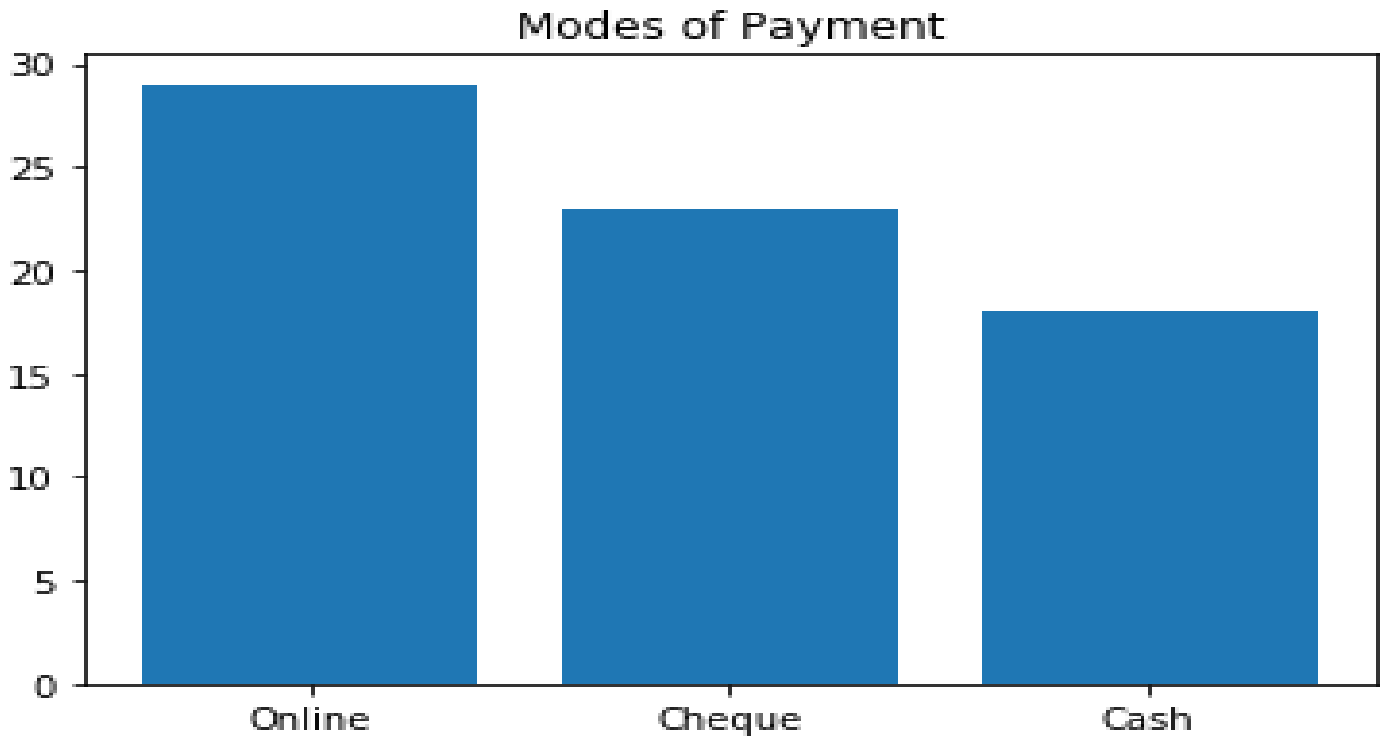



```
In [18]: plt.hist(iris['Sepal.Length'],color='purple',histtype='step')
    ...: plt.title("Sepal Length of Iris")
Out[18]: Text(0.5,1,'Sepal Length of Iris')
```



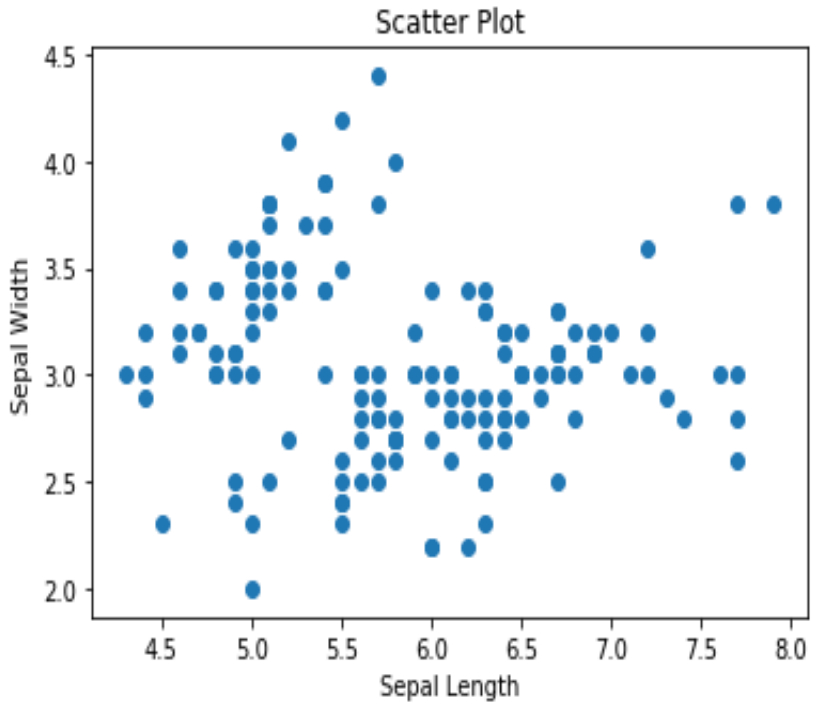
Bar Chart

```
In [57]: cts = Orders['Payment Terms'].value_counts()
    ...: ind = np.arange(3)
    ...: plt.bar(ind,cts)
    ...: plt.xticks(ind,('Online','Cheque','Cash'))
    ...: plt.title("Modes of Payment")
    ...: plt.show()
```

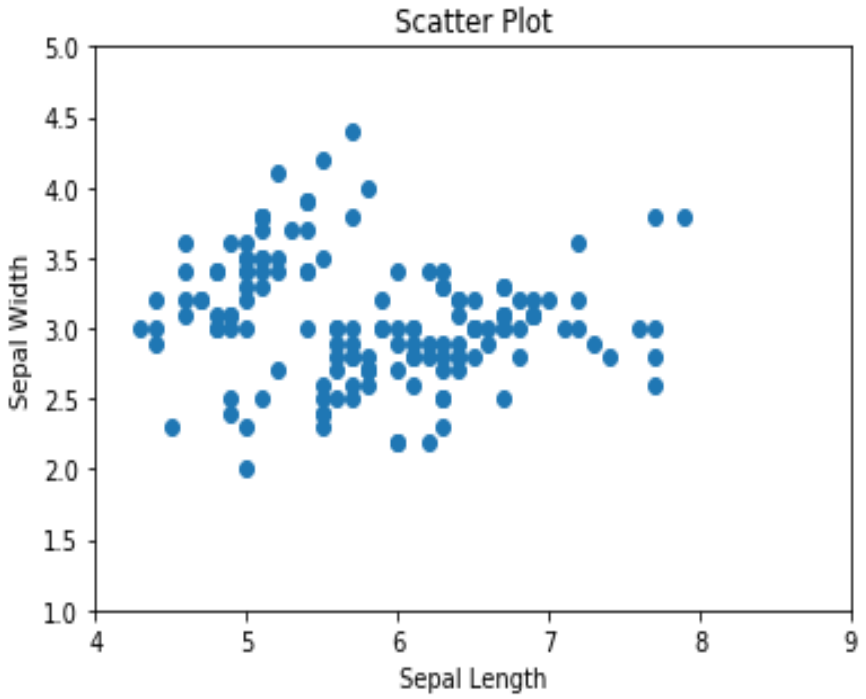


Customizing the axes

```
In [20]: plt.scatter(iris['Sepal.Length'], iris['Sepal.Width'])
    ...: plt.xlabel("Sepal Length")
    ...: plt.ylabel("Sepal Width")
    ...: plt.title('Scatter Plot')
    ...: plt.show()
    ...:
```




```
In [21]: plt.scatter(iris['Sepal.Length'], iris['Sepal.Width'])
    ...: plt.xlabel("Sepal Length")
    ...: plt.ylabel("Sepal Width")
    ...: plt.title('Scatter Plot')
    ...: plt.axis((4,9,1,5))
    ...: plt.show()
```



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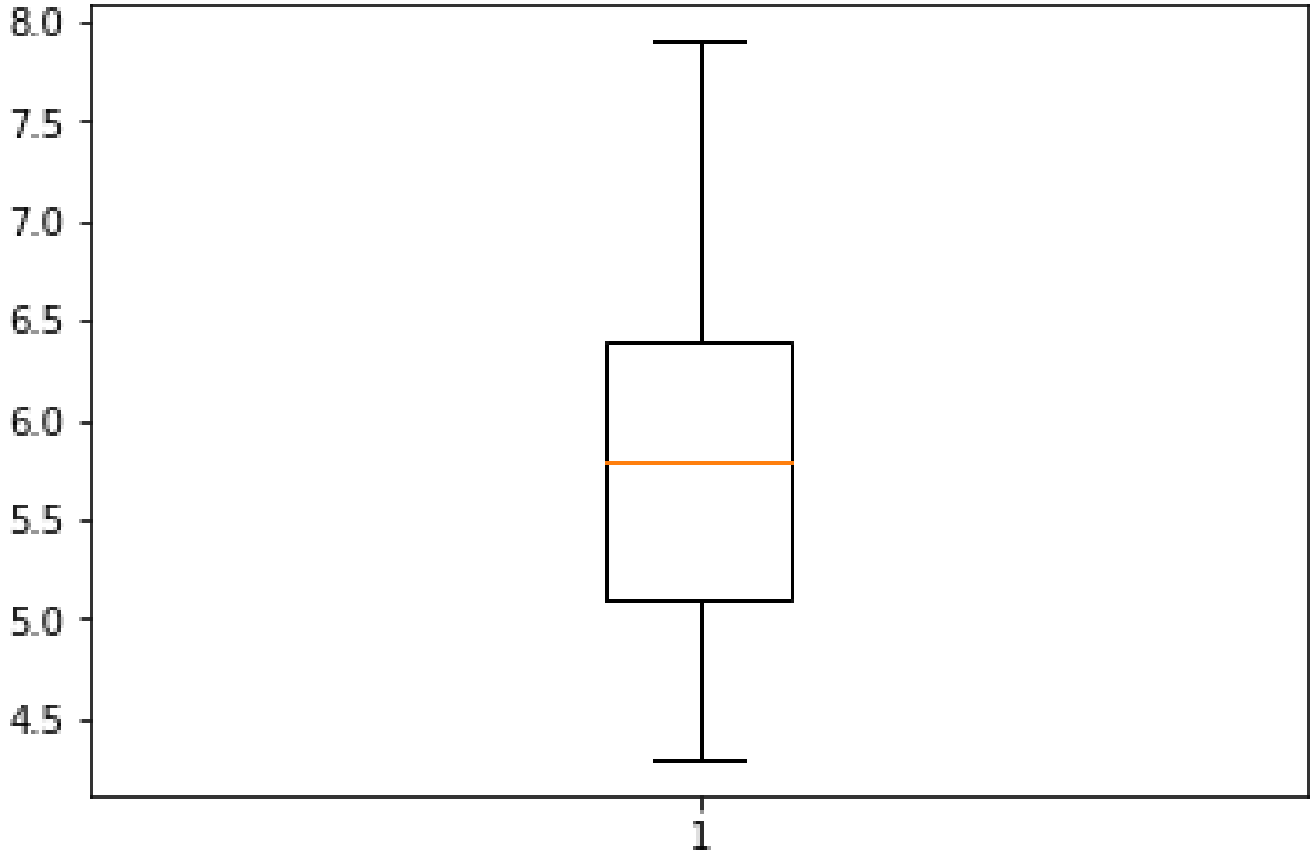
Boxplot

```
In [61]: plt.boxplot(iris['Sepal.Length'])
    ...: plt.show()
```

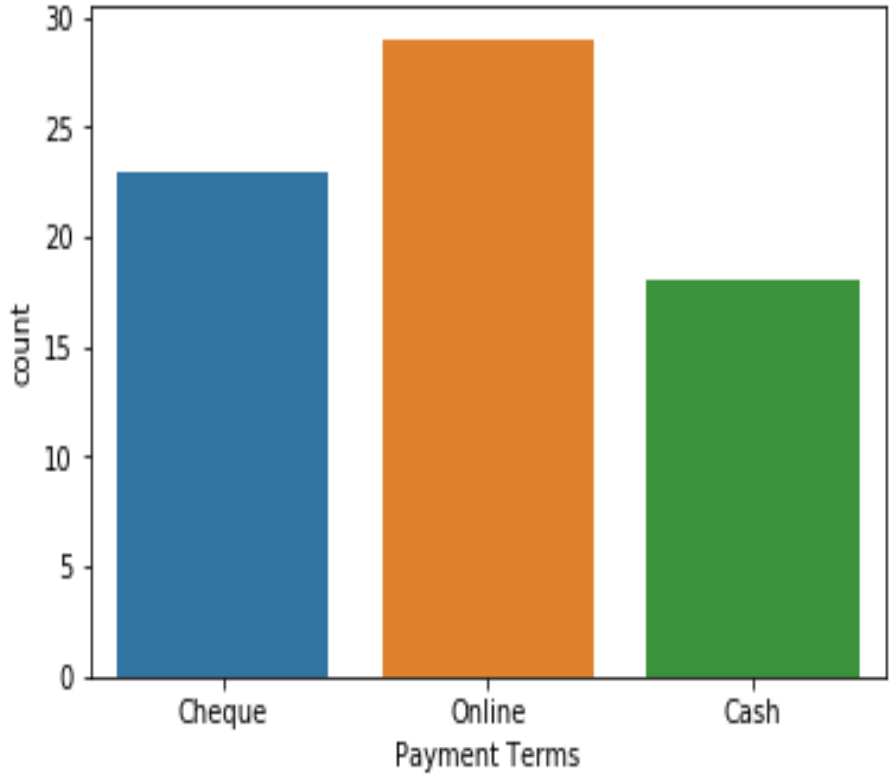


Library seaborn

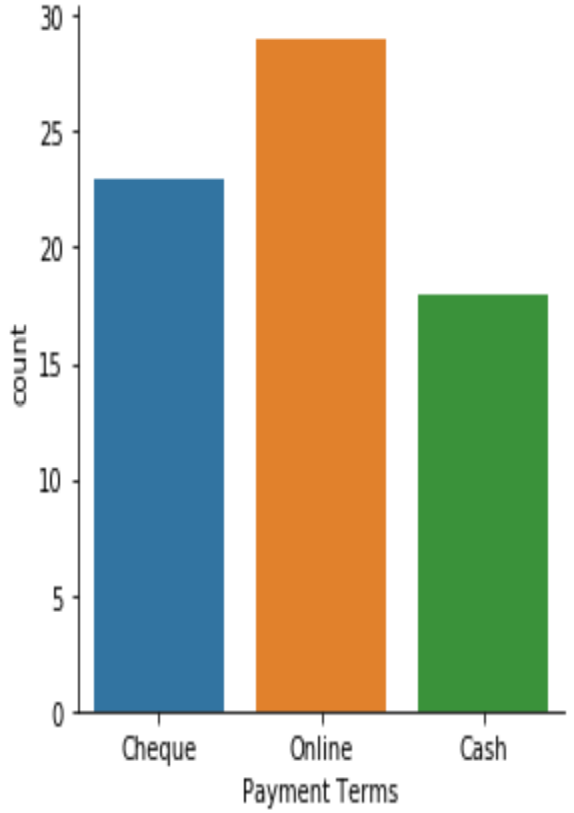
- Seaborn is a Python data visualization library based on matplotlib.
- It provides a high-level interface for drawing attractive and informative statistical graphics.

Bar Chart

```
In [22]: import seaborn as sns
    ...: sns.countplot('Payment Terms',data=Orders)
    ...: plt.show()
```

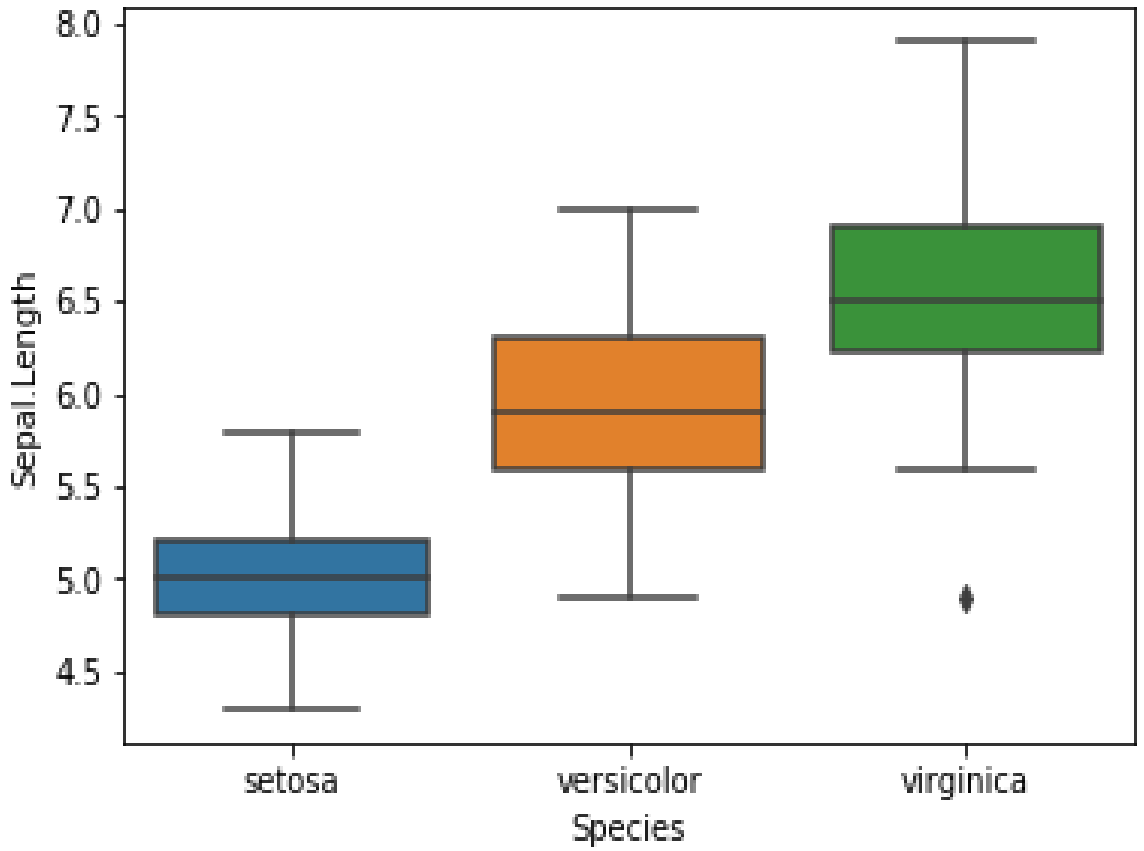



```
In [31]: g = sns.factorplot('Payment Terms',data=Orders, kind="count")
    ...: plt.show()
```



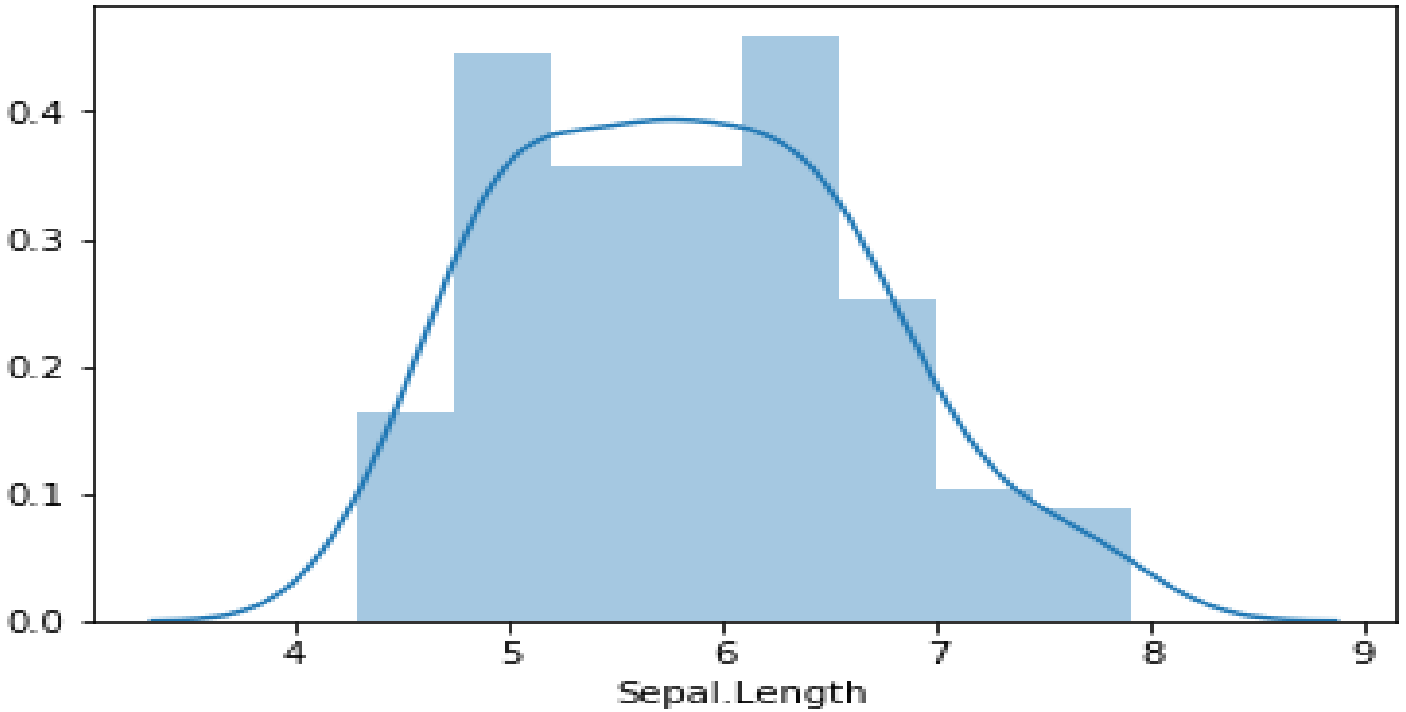
Boxplot

```
In [33]: sns.boxplot(x='Species', y='Sepal.Length', data=iris)
    ...: plt.show()
```



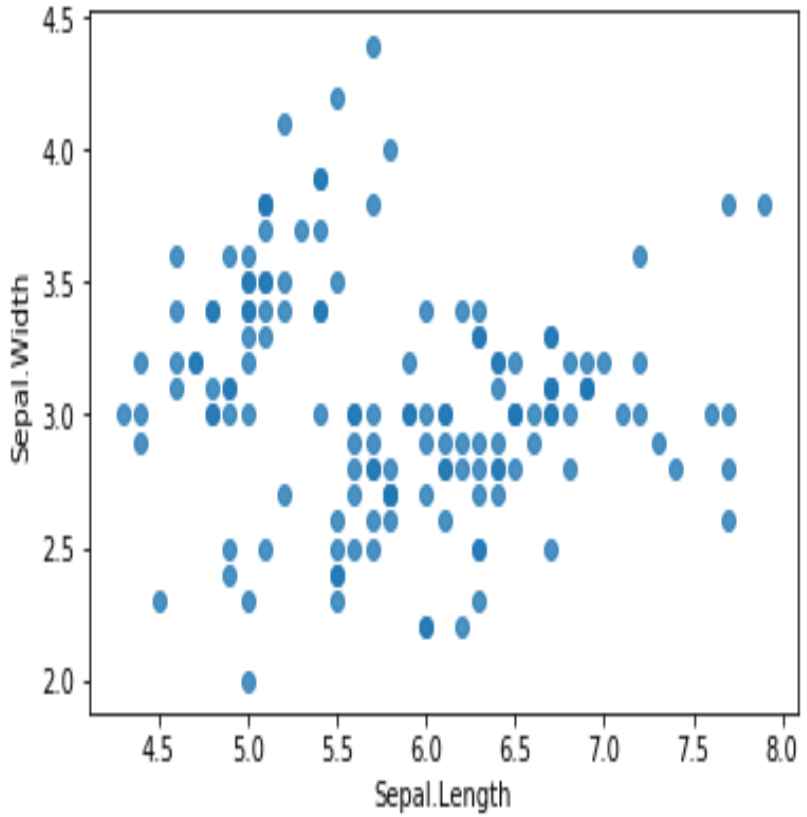
Histogram

```
sns.distplot(iris['Sepal.Length'])
plt.show()
```

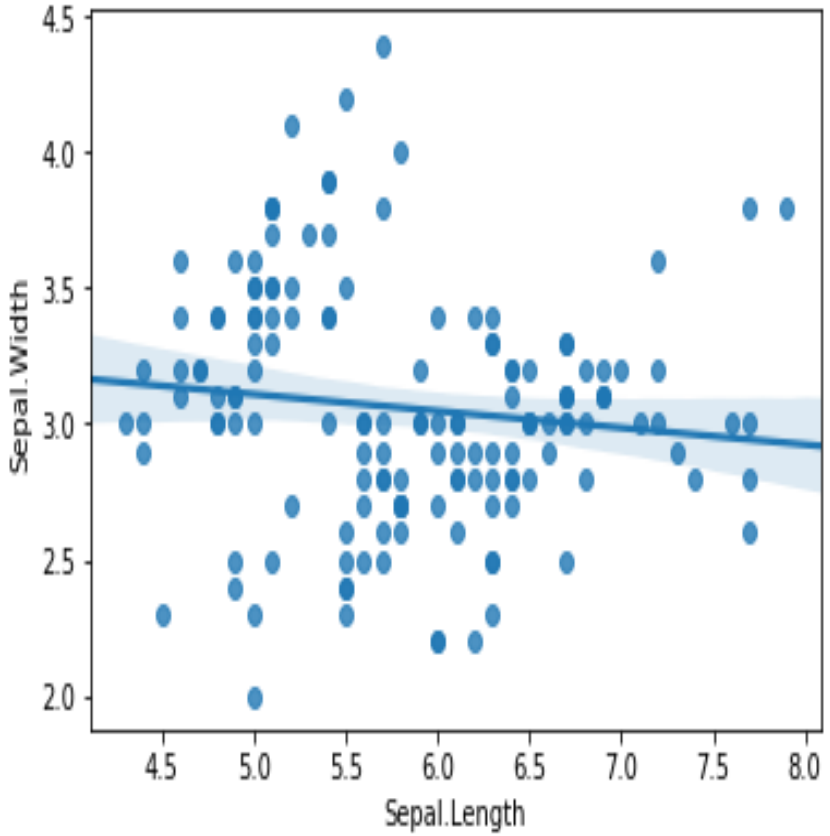


Scatter Plot

```
In [35]: sns.regplot(x='Sepal.Length', y='Sepal.Width', data=iris,
fit_reg=False)
    ...: plt.show()
```

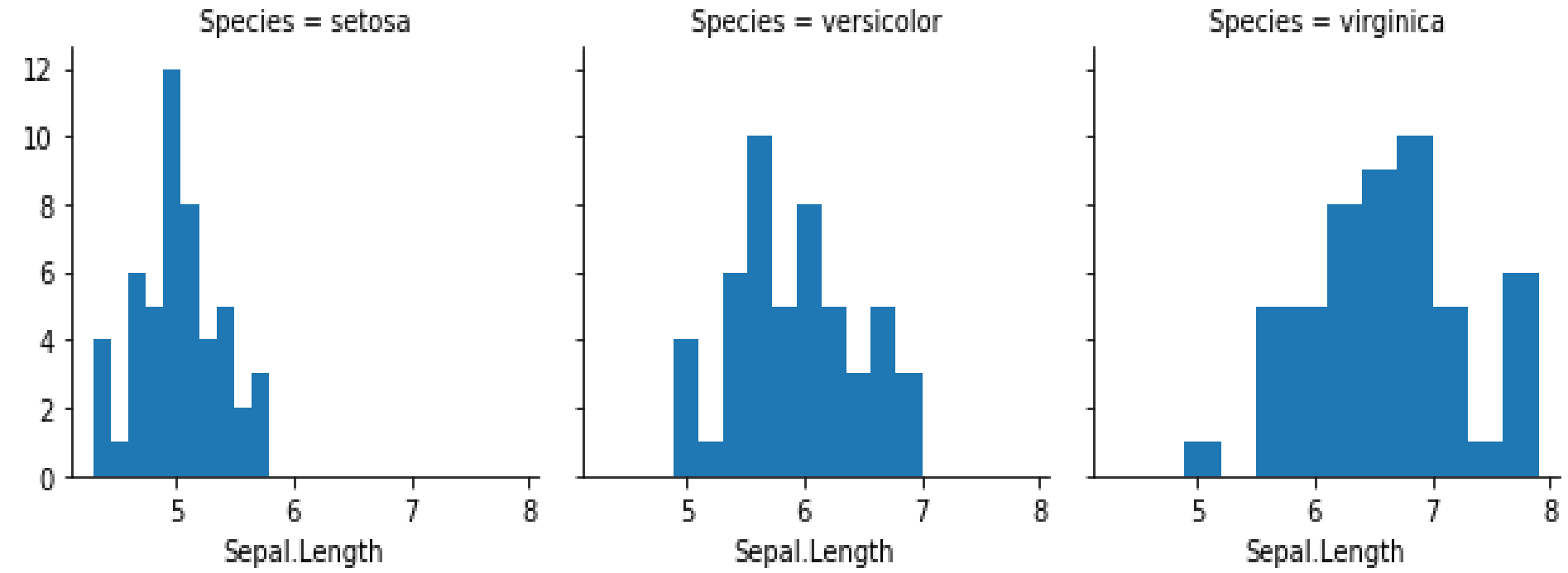



```
In [36]: sns.regplot(x='Sepal.Length', y='Sepal.Width', data=iris)
    ...: plt.show()
```



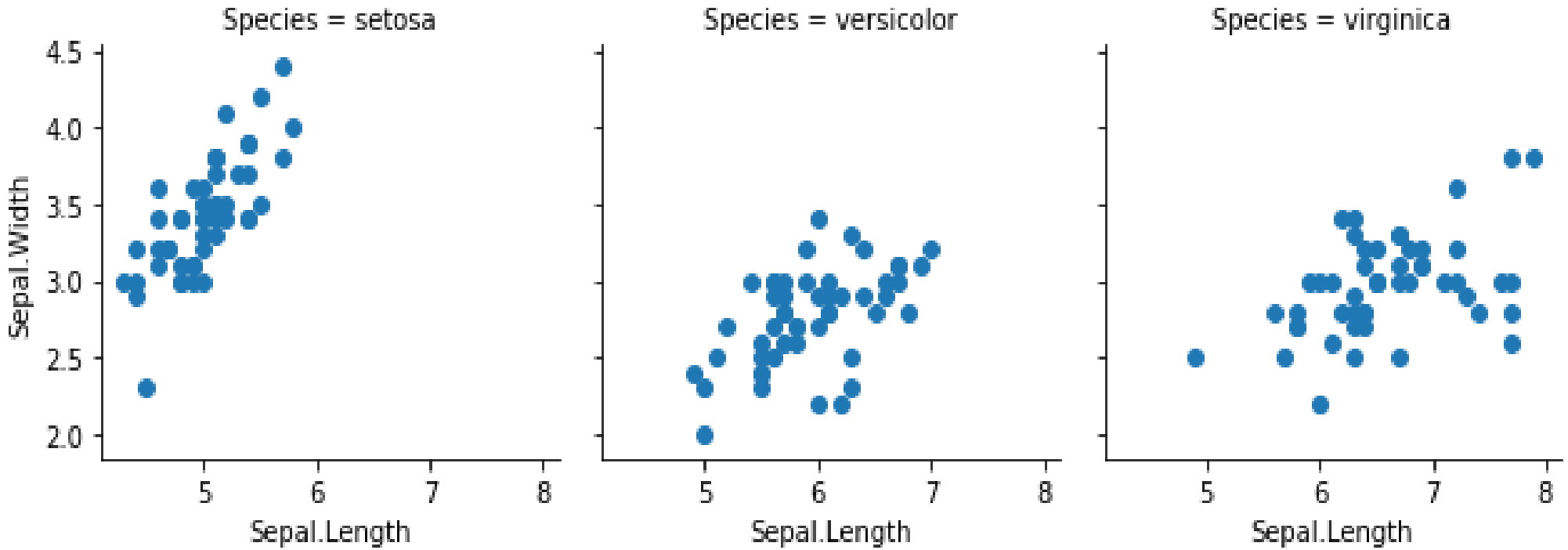
Facet Grid

```
In [37]: g = sns.FacetGrid(iris, col="Species")
    ...: g = g.map(plt.hist, "Sepal.Length")
    ...: plt.show()
```



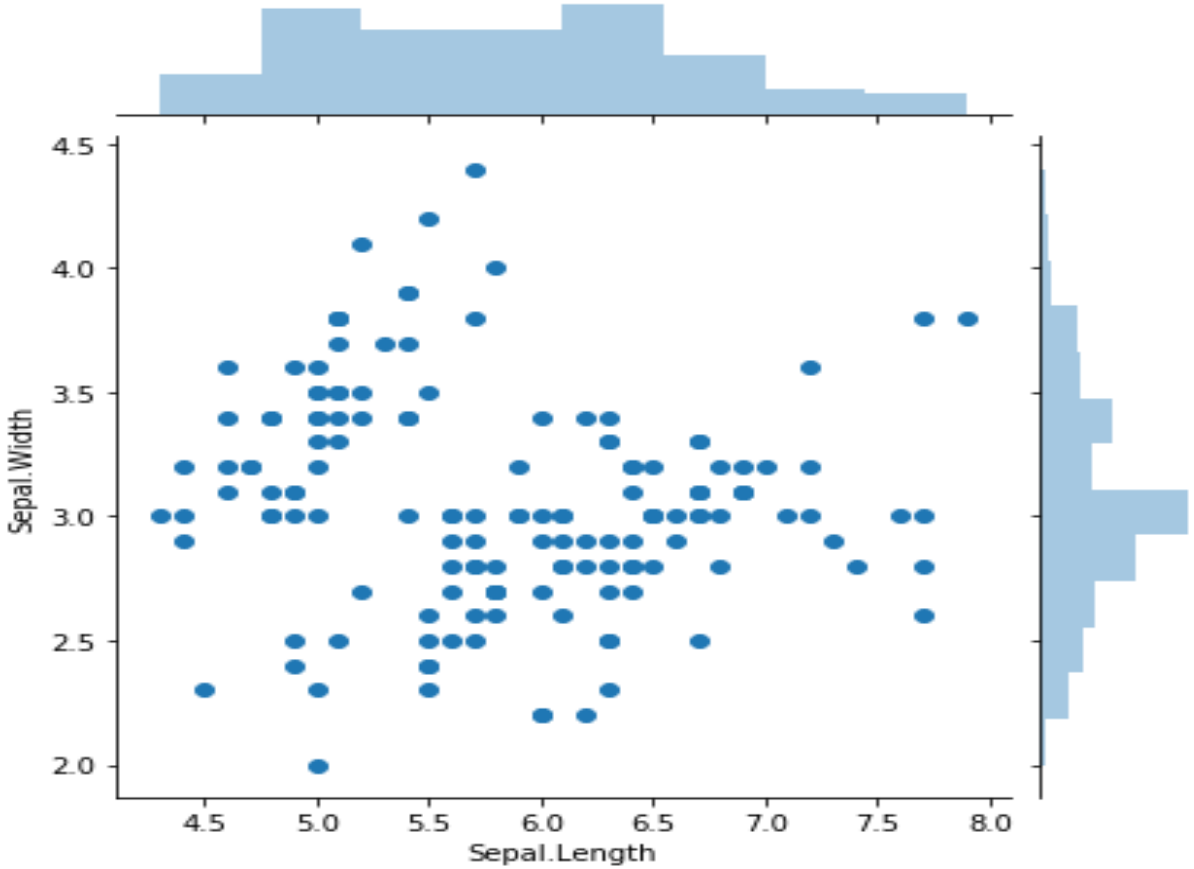
Facet Grid

```
In [39]: g = sns.FacetGrid(iris, col="Species")
    ...: g = g.map(plt.scatter, "Sepal.Length","Sepal.Width")
    ...: plt.show()
```



Joint Plot

```
In [37]: sns.jointplot(x='Sepal.Length', y='Sepal.Width', data=iris)
    ...: plt.show()
```



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Questions?