

Name: Manav Shah
Roll No: 231070902
Second Year CS
Subject: **Programming Lab1**

Experiment No. 9

AIM: To plot different graphs using matplotlib library.

THEORY:

Matplotlib:

Matplotlib is a Python library for creating static, animated, and interactive visualizations in a variety of formats. It's a powerful tool for data visualization and is widely used in fields like data science, machine learning, and scientific research.

With Matplotlib, you can create line plots, scatter plots, bar plots, histograms, pie charts, and more. It provides a high level of customization, allowing you to fine-tune your plots to suit your needs.

Matplotlib is a low level graph plotting library in python that serves as a visualization utility. Matplotlib was created by John D. Hunter. Matplotlib is open source and we can use it freely. Matplotlib is mostly written in python, a few segments are written in C, Objective-C and Javascript for Platform compatibility.

Most of the Matplotlib utilities lie under the **pyplot** submodule, and are usually imported under the **plt** alias.

The **plot()** function is used to draw points (markers) in a diagram. By default, the **plot()** function draws a line from point to point.

Dataset Link:

<https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data>

CODE:

To plot different graphs using matplotlib library.

```
import pandas as pd
import matplotlib.pyplot as plt
from datasets import load_dataset
import seaborn as sns
from matplotlib.figure import Figure
```

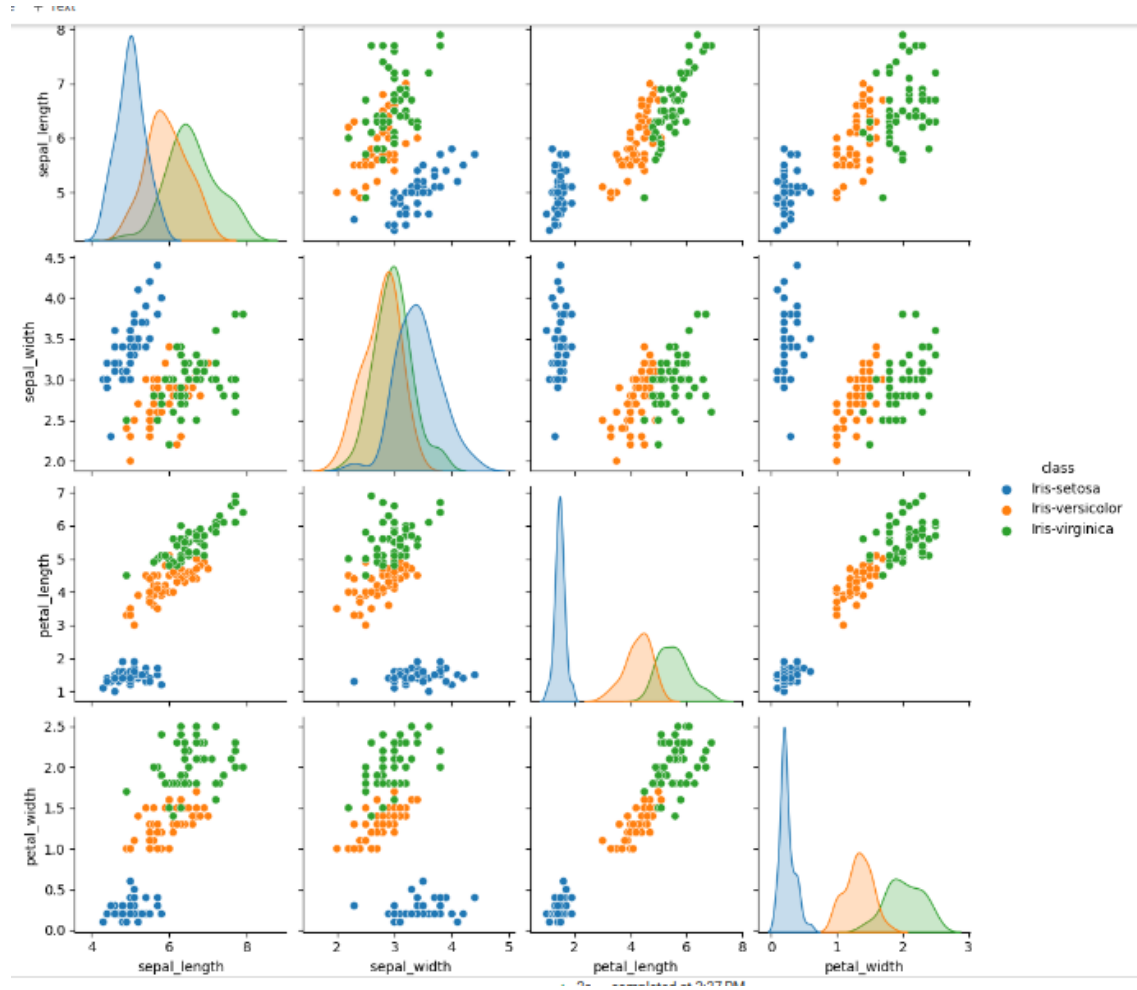
```
cols = ['sepal_length', 'sepal_width', 'petal_length', 'petal_width',
        'class']
df =
pd.read_csv("https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data", names=cols)
df.head()
```

Output:

	sepal_length	sepal_width	petal_length	petal_width	class
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa

```
sns.pairplot(df, hue='class');
```

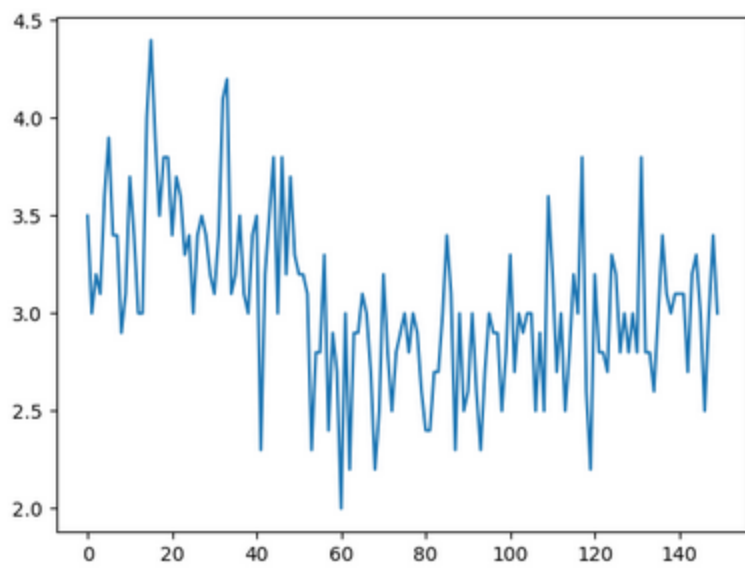
Output:



```
plt.plot(df['sepal_width'])
```

Output:

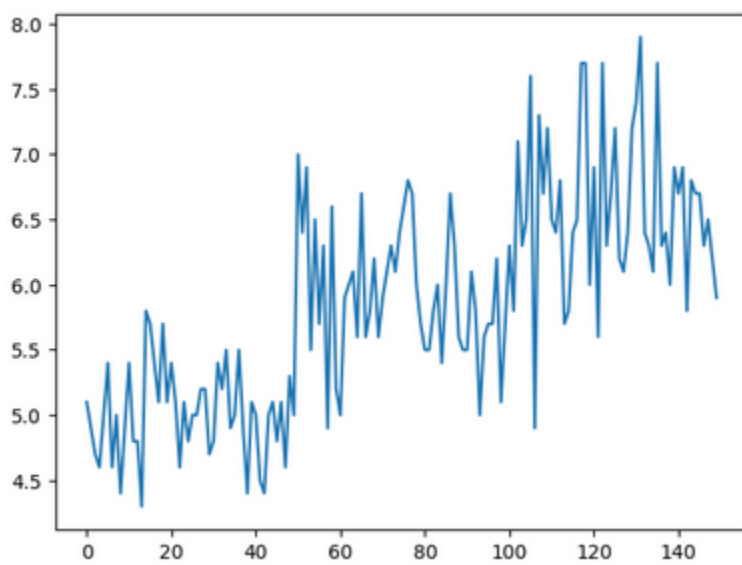
```
[<matplotlib.lines.Line2D at 0x7e5dd28d0370>]
```



```
plt.plot(df['sepal_length'])
```

Output:

```
[<matplotlib.lines.Line2D at 0x7e5dd28730a0>]
```

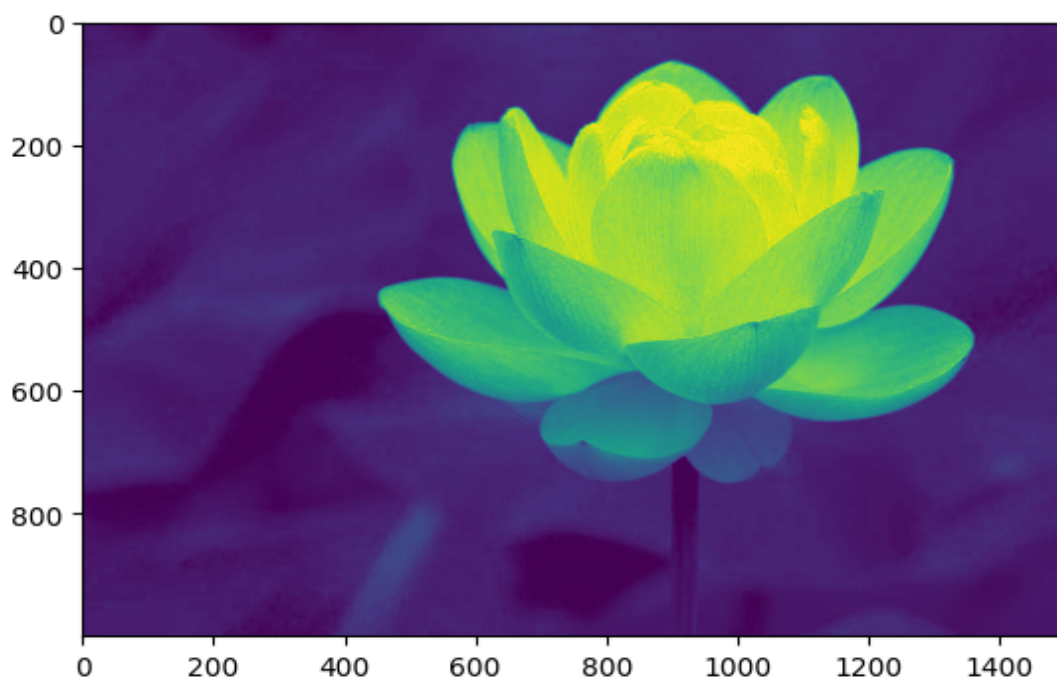


```
imgplot = plt.imshow(img)
```



```
lum_img = img[:, :, 0]  
plt.imshow(lum_img)
```

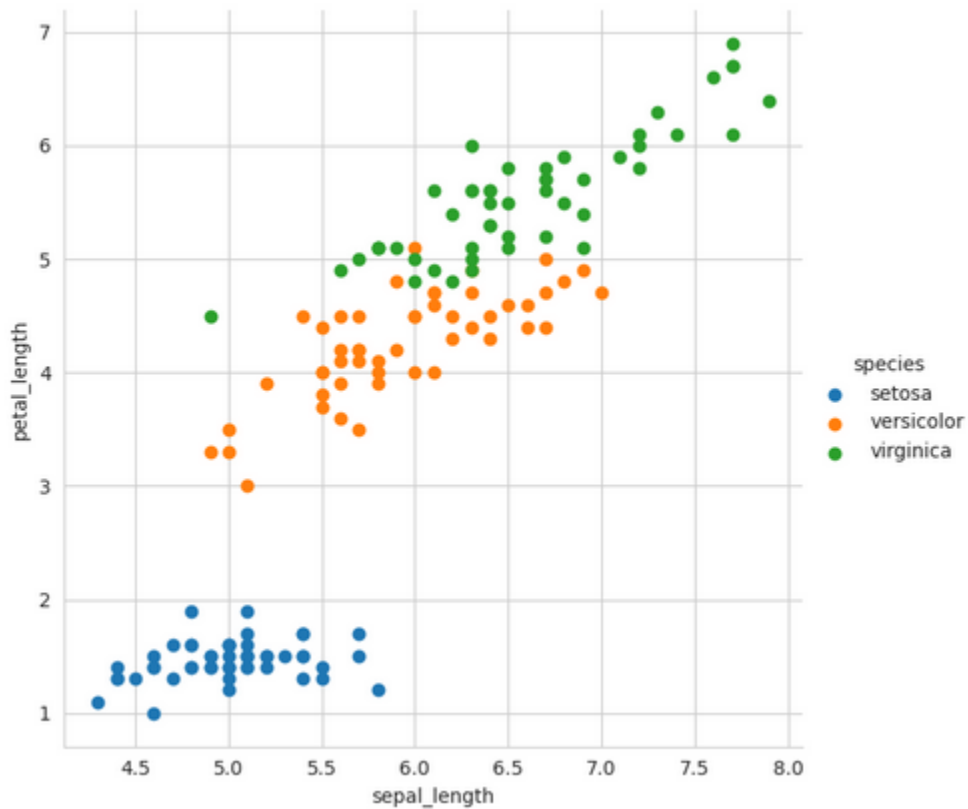
<matplotlib.image.AxesImage at 0x79f0a5d38cd0>



```
iris = sns.load_dataset('iris')
sns.set_style("whitegrid")
sns.FacetGrid(iris, hue = "species",
              height = 6).map(plt.scatter,
                              'sepal_length',
                              'petal_length').add_legend()
```

Output:

<seaborn.axisgrid.FacetGrid at 0x7e5dd0231060>

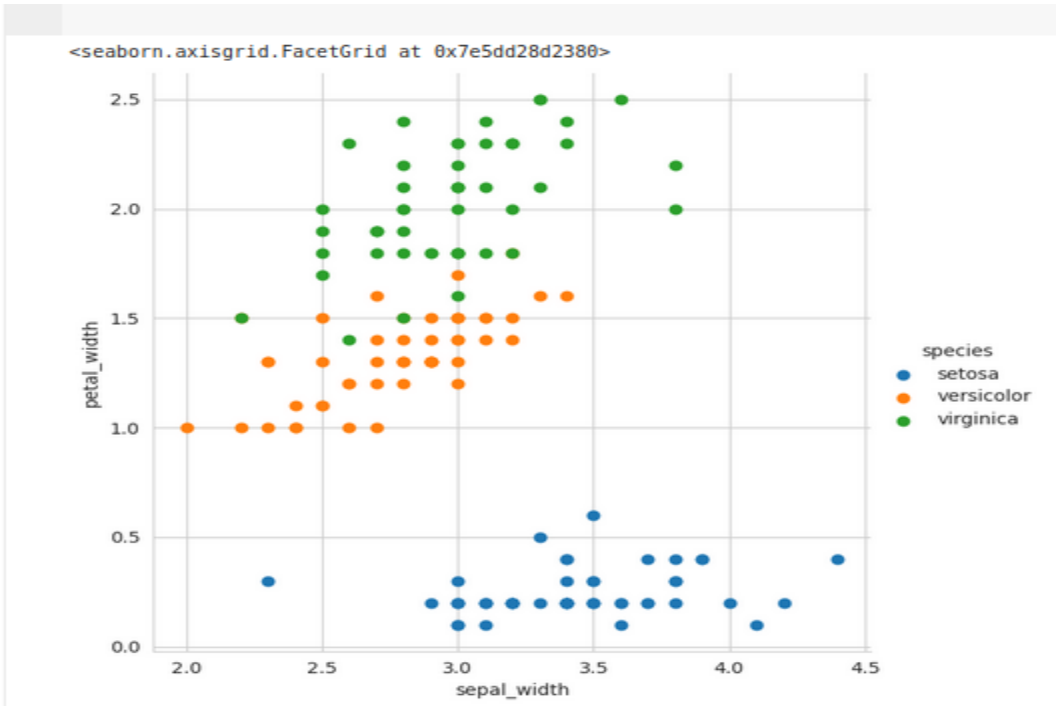


```
fig = plt.figure(figsize = (5, 4))
```

```
# Adding the axes to the figure
```

```
ax = fig.add_axes([1, 1, 1, 1])
```


Output:

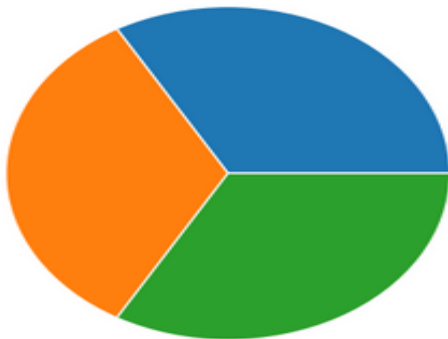


```
setosa_count = sum([i=='Iris-setosa' for i in df['class']])
versicolor_count = sum([i=='Iris-versicolor' for i in df['class']])
virginica_count = sum([i=='Iris-virginica' for i in df['class']])
x = (0.1, 0, 0)
plt.pie([setosa_count, versicolor_count, virginica_count])
plt.title("Iris Classes")
```

Output:

Text(0.5, 1.0, 'Iris Classes')

Iris Classes



CONCLUSION : From this experiment, we learnt how to plot different graphs using matplotlib library. We worked on the iris dataset and also used the data from the dataset to plot different graphs such as pie chart, bar graph, line chart, scatter plot, working on images by providing color gradients which can be very useful for data analysis and visualization..