Iris Flower Classification

importing libraries

In [1]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

import warnings
warnings.filterwarnings('ignore')
```

Loading the dataset

In [3]:

```
df = pd.read_csv('Iris.csv')
df.head()
```

Out[3]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

In [4]:

```
#delete id column from the data
df = df.drop(columns=['Id'])
df.head()
```

Out[4]:

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
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

In [5]:

```
df.describe()
```

Out[5]:

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
count	150.000000	150.000000	150.000000	150.000000
mean	5.843333	3.054000	3.758667	1.198667
std	0.828066	0.433594	1.764420	0.763161
min	4.300000	2.000000	1.000000	0.100000
25%	5.100000	2.800000	1.600000	0.300000
50%	5.800000	3.000000	4.350000	1.300000
75%	6.400000	3.300000	5.100000	1.800000
max	7.900000	4.400000	6.900000	2.500000

In [6]:

```
# Dataset info
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 5 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   SepalLengthCm  150 non-null    float64
 1   SepalWidthCm   150 non-null    float64
 2   PetalLengthCm  150 non-null    float64
 3   PetalWidthCm   150 non-null    float64
 4   Species        150 non-null    object 
dtypes: float64(4), object(1)
memory usage: 6.0+ KB
```

In [7]:

```
# display the number of sample of each class
df['Species'].value_counts()
```

Out[7]:

```
Iris-setosa        50
Iris-versicolor    50
Iris-virginica     50
Name: Species, dtype: int64
```

Preprocessing the dataset

In [8]:

```
# checking null value
df.isnull().sum()
```

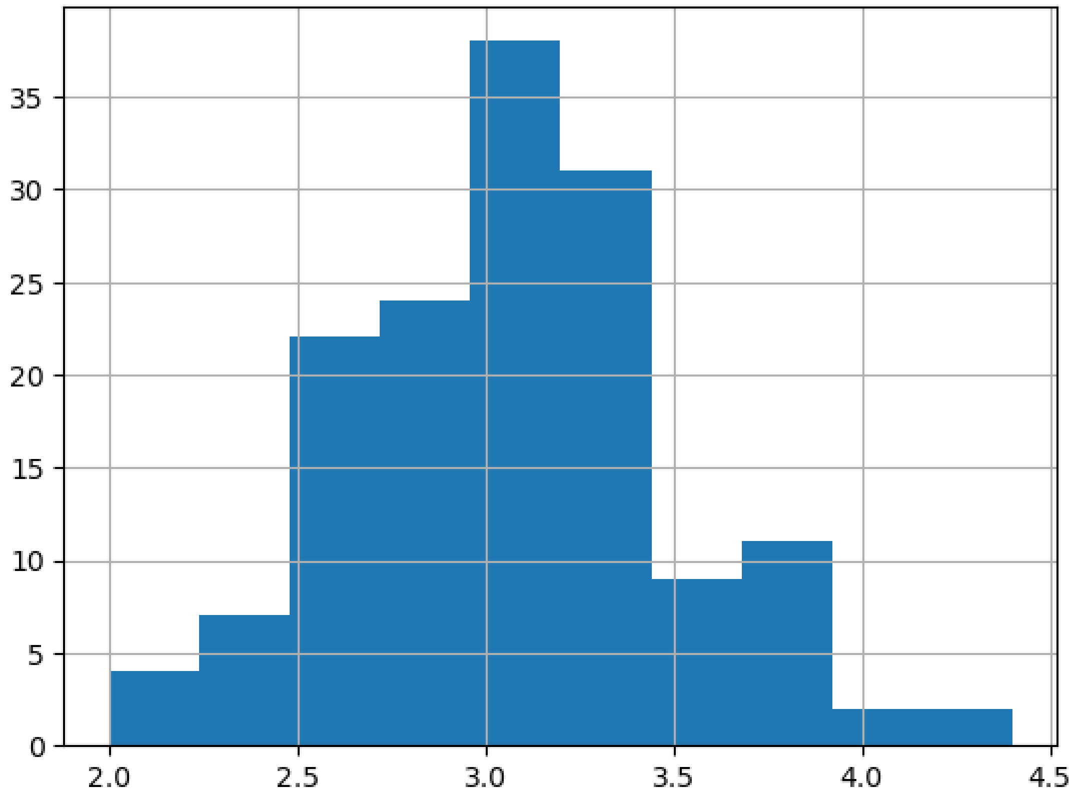
Out[8]:

```
SepalLengthCm    0
SepalWidthCm     0
PetalLengthCm    0
PetalWidthCm     0
Species          0
dtype: int64
```

Exploratory Data Analysis (EDA)

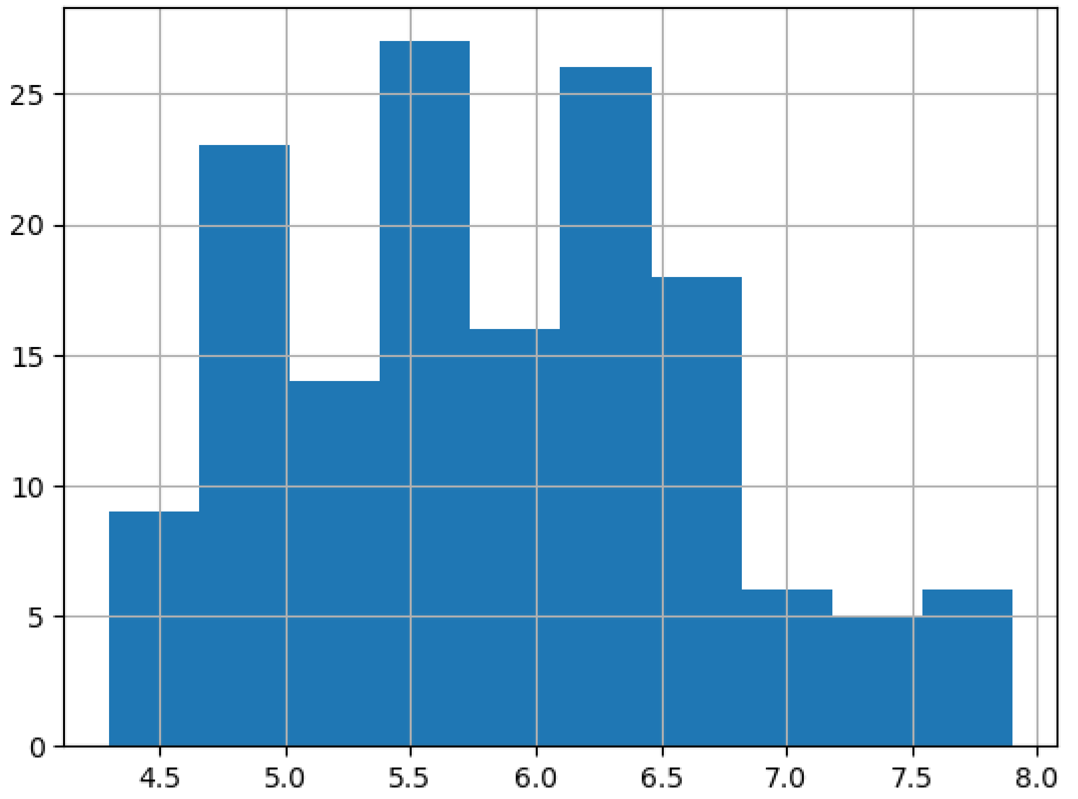
In [10]:

```
df['SepalWidthCm'].hist() #hisogram
plt.show()
```



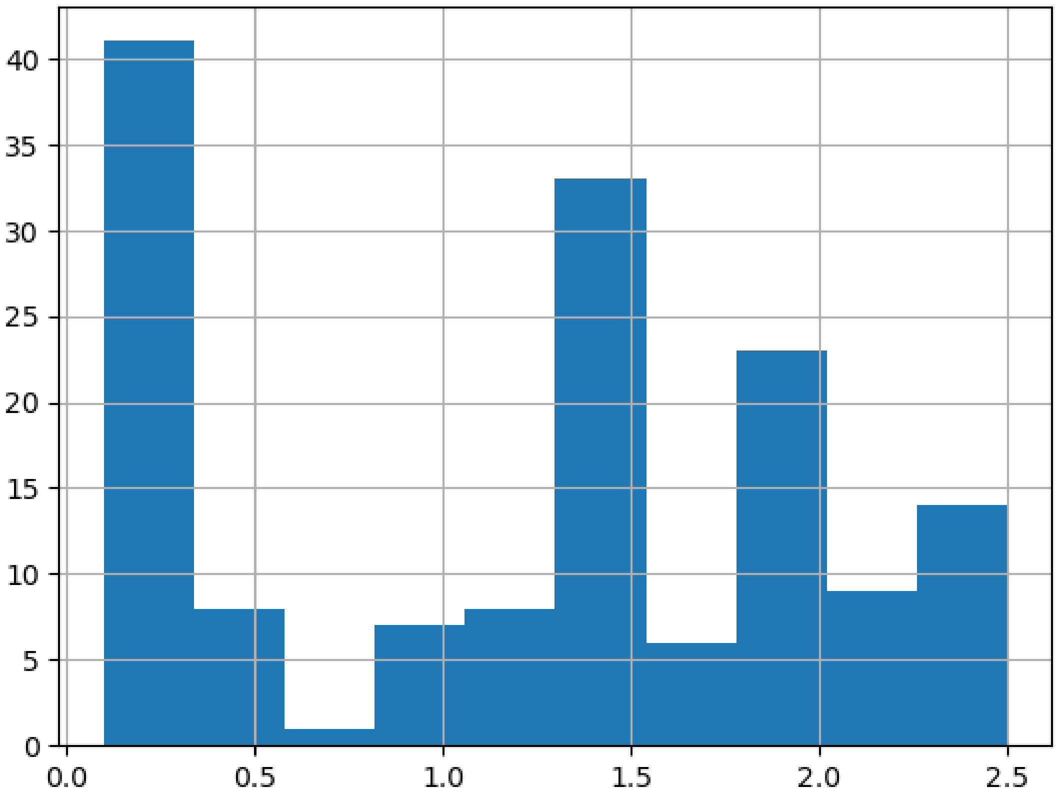
In [11]:

```
df['SepalLengthCm'].hist() #hisogram
plt.show()
```

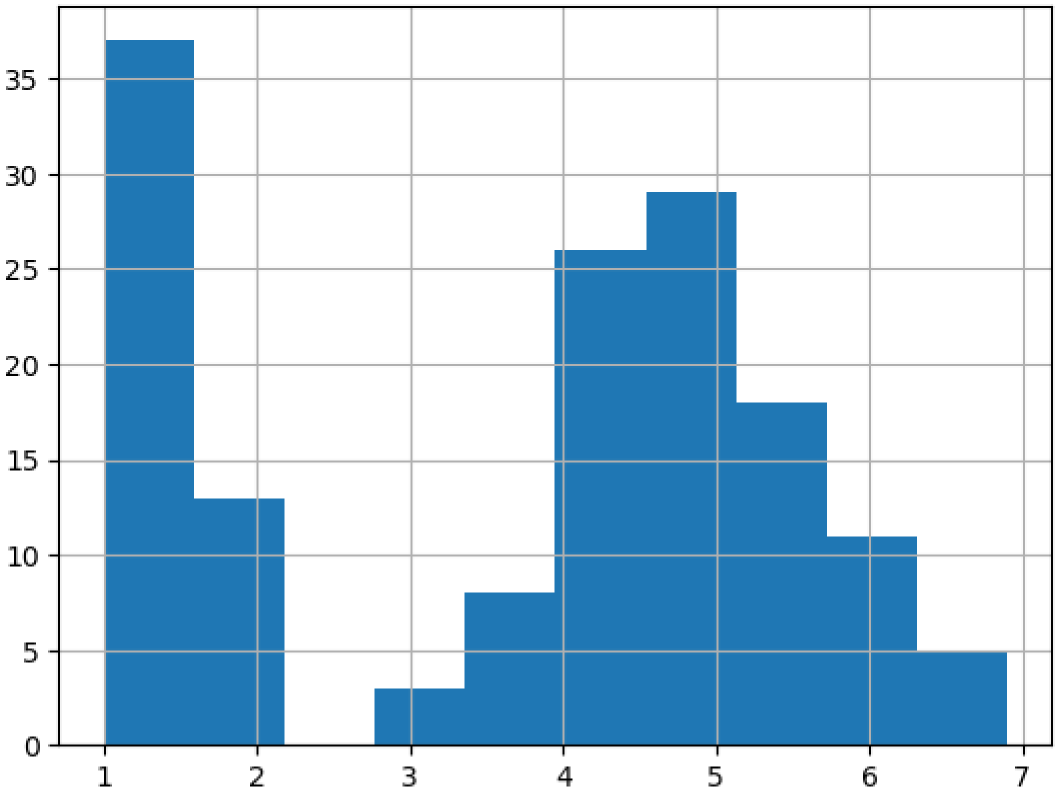


In [12]:

```
df['PetalWidthCm'].hist() #hisogram
plt.show()
```

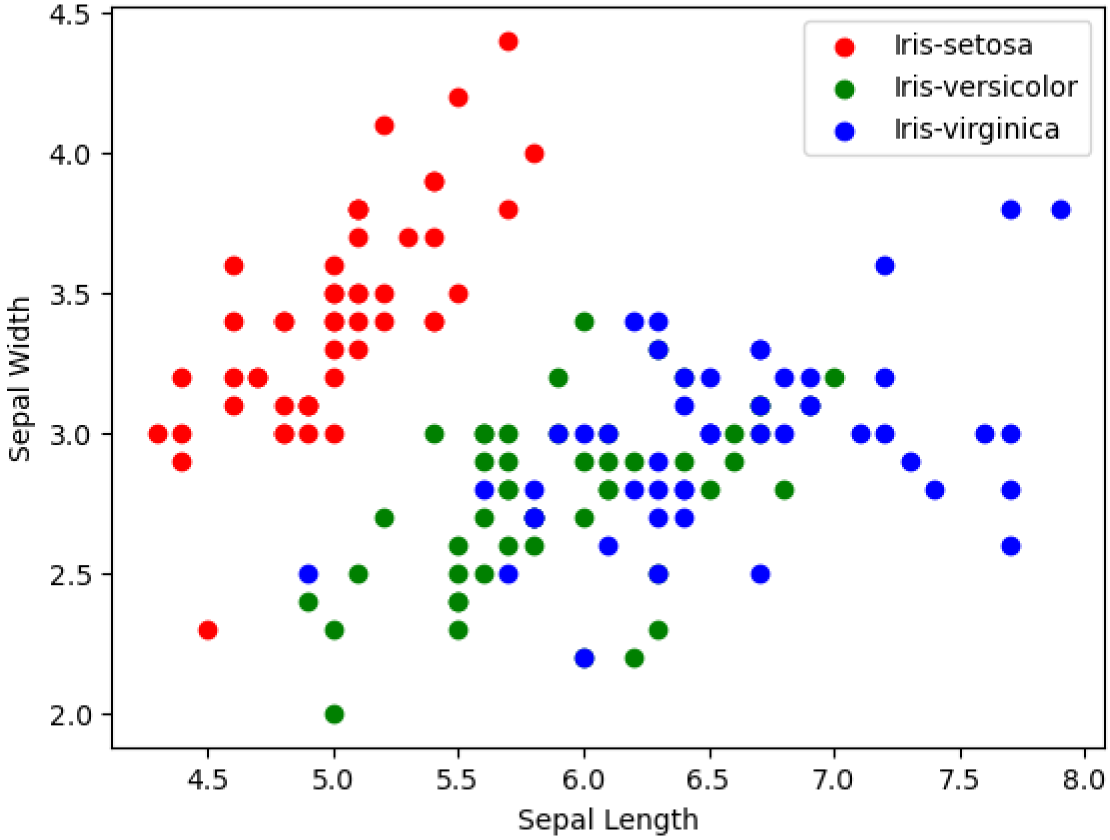


In [13]:
```
df['PetalLengthCm'].hist() #hisogram
plt.show()
```



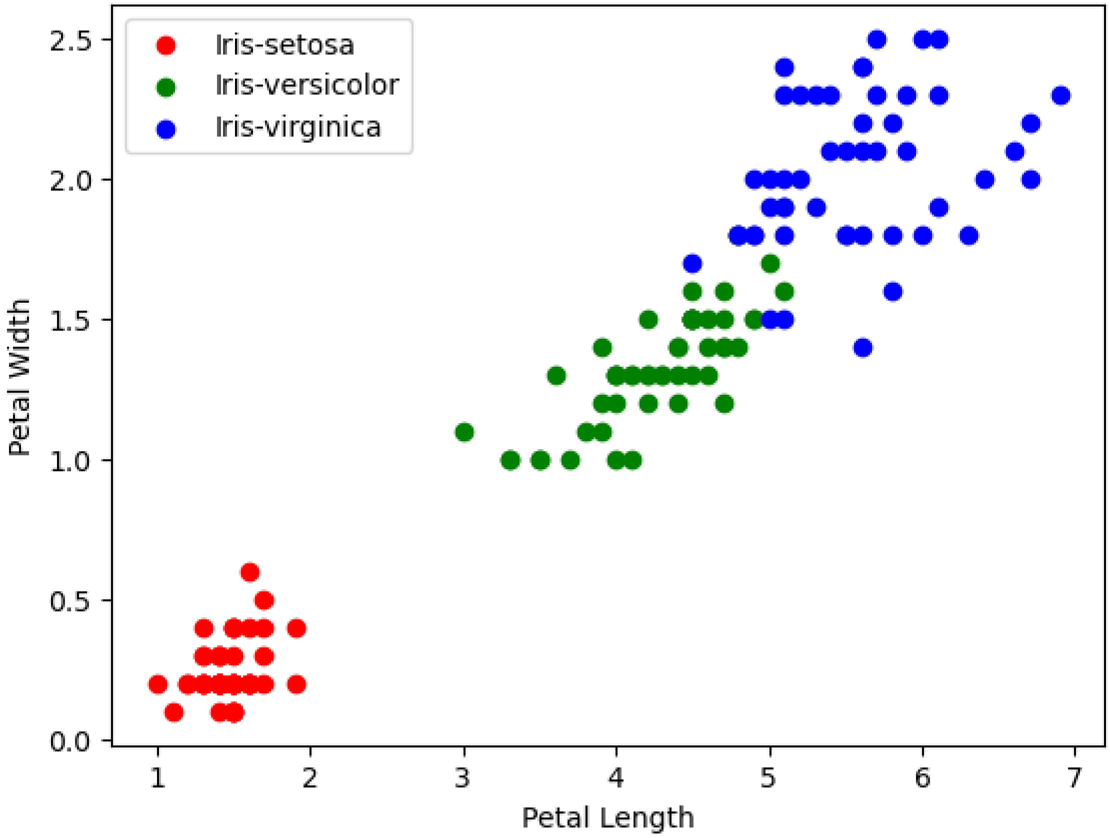
In [22]:
```
# creating a scatterplot
colors = ['red', 'green', 'blue']
species = ['Iris-setosa', 'Iris-versicolor', 'Iris-virginica']

for i in range(3):
    x = df[df['Species'] == species[i]]
    #print(x)
    plt.scatter(x['SepalLengthCm'], x['SepalWidthCm'], c = colors[i], label=species
plt.xlabel('Sepal Length')
plt.ylabel('Sepal Width')
plt.legend()
plt.show()
```



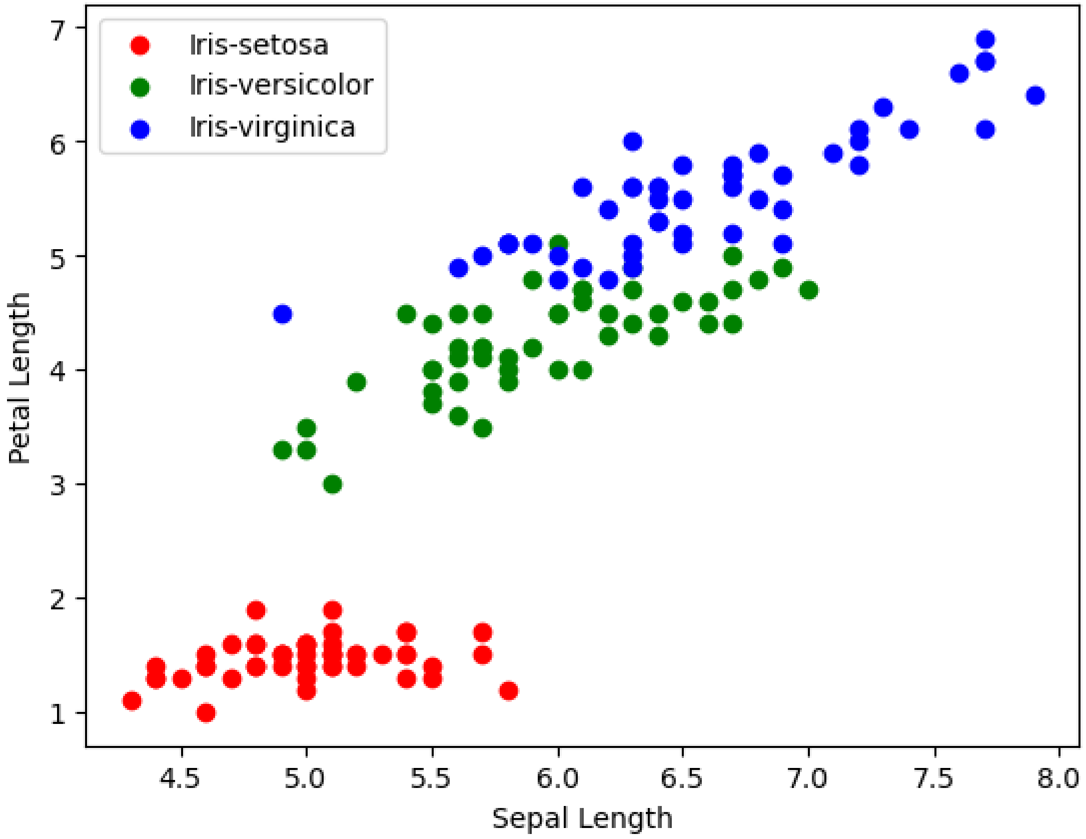
In [23]:

```
for i in range(3):
    x = df[df['Species'] == species[i]]
    #print(x)
    plt.scatter(x['PetalLengthCm'], x['PetalWidthCm'], c = colors[i], label=species
plt.xlabel('Petal Length')
plt.ylabel('Petal Width')
plt.legend()
plt.show()
```



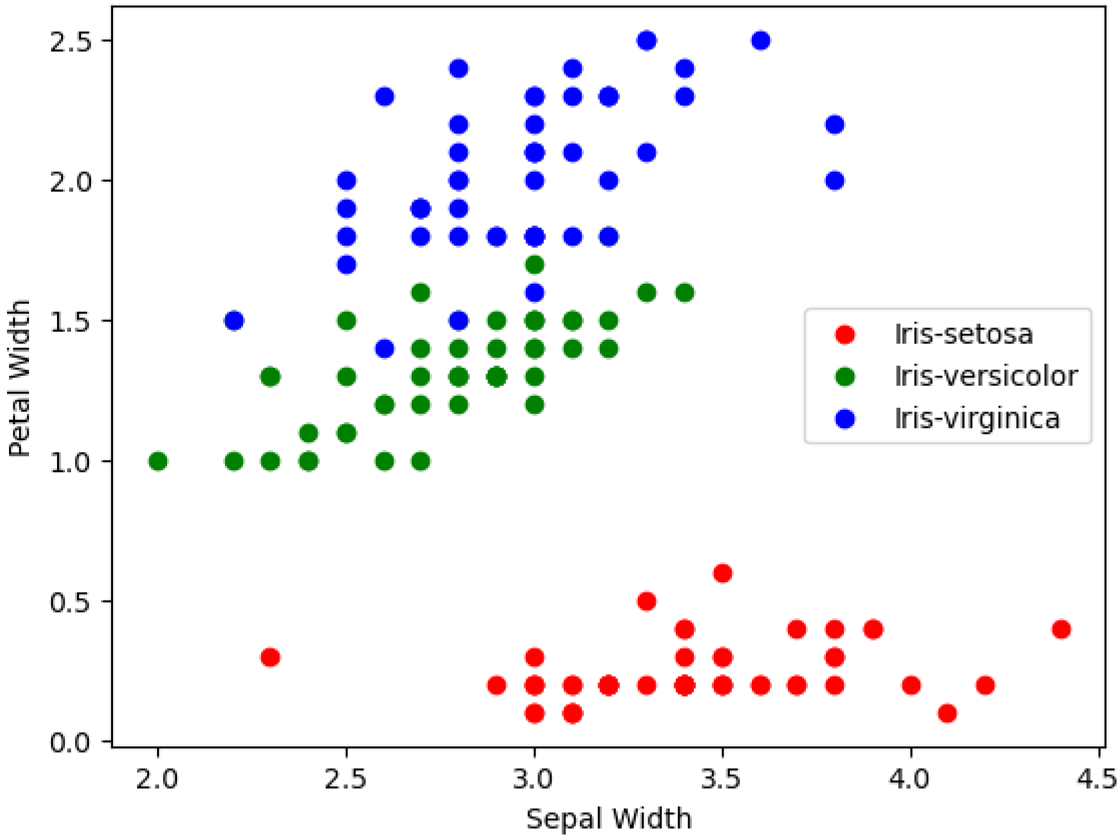
In [24]:

```
for i in range(3):
    x = df[df['Species'] == species[i]]
    #print(x)
    plt.scatter(x['SepalLengthCm'], x['PetalLengthCm'], c = colors[i], label=specie
plt.xlabel('Sepal Length')
plt.ylabel('Petal Length')
plt.legend()
plt.show()
```



In [25]:

```
for i in range(3):
    x = df[df['Species'] == species[i]]
    #print(x)
    plt.scatter(x['SepalWidthCm'], x['PetalWidthCm'], c = colors[i], label=species[
plt.xlabel('Sepal Width')
plt.ylabel('Petal Width')
plt.legend()
plt.show()
```



Coorelation Matrix

In [26]:

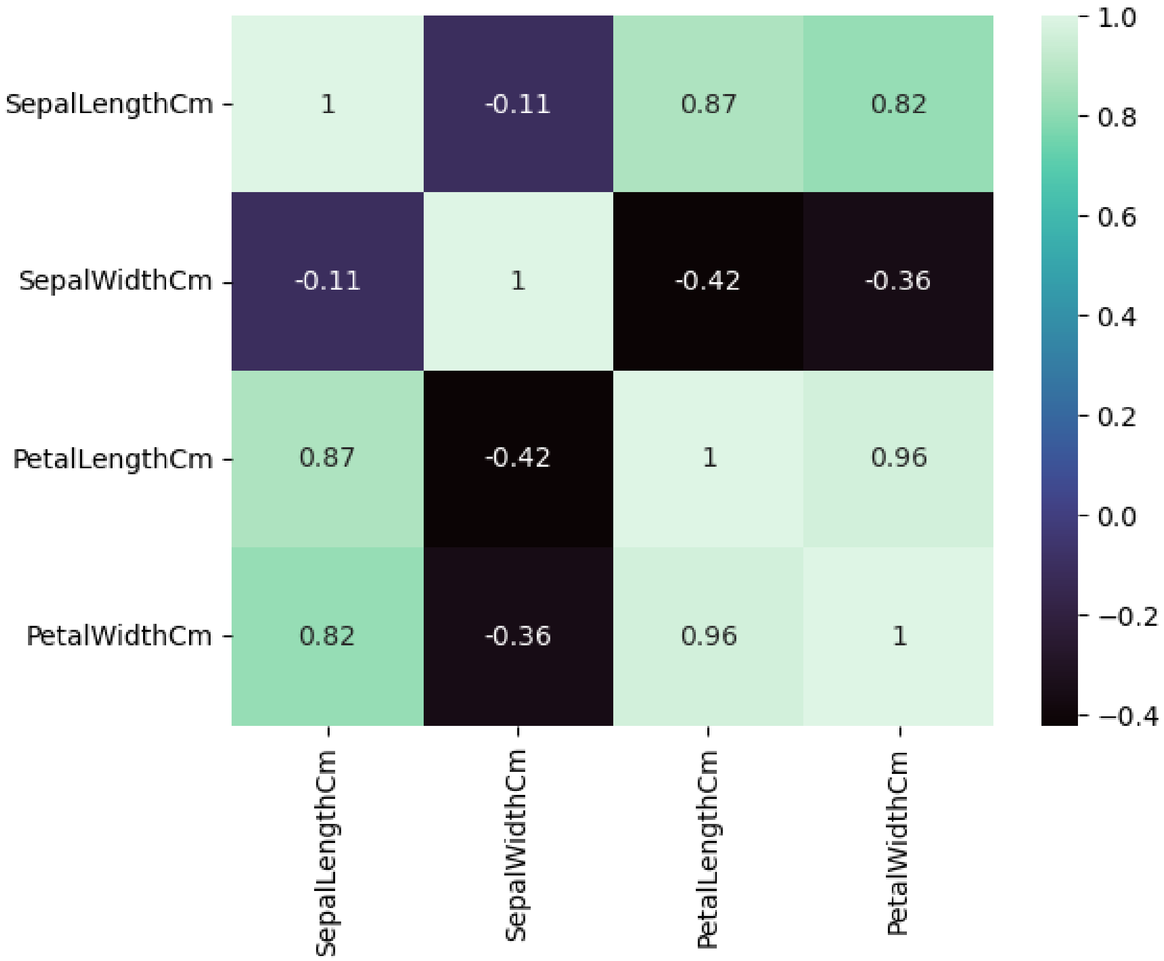
```
# showing correlation coefficients between variables
df.corr()
```

Out[26]:

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
SepalLengthCm	1.000000	-0.109369	0.871754	0.817954
SepalWidthCm	-0.109369	1.000000	-0.420516	-0.356544
PetalLengthCm	0.871754	-0.420516	1.000000	0.962757
PetalWidthCm	0.817954	-0.356544	0.962757	1.000000

In [27]:

```
# heatmap
corr = df.corr()
sns.heatmap(corr, annot=True, cmap='mako')
plt.show()
```



Training a Model

In [28]:

```
from sklearn.model_selection import train_test_split
X = df.drop(columns=['Species'])
Y = df['Species']

X_train, X_test, y_train, y_test = train_test_split(X, Y, test_size=0.30)
```

Logistic Regression

In [29]:

```
from sklearn.linear_model import LogisticRegression
model = LogisticRegression()
```

In [30]:

```
# training model
model.fit(X_train, y_train)
```

Out[30]:

```
▾ LogisticRegression
LogisticRegression()
```

In [37]:

```
# model accuracy
print("Accuracy : ", model.score(X_test, y_test) * 100)
```

```
Accuracy :  95.55555555555556
```

In [38]:

```
model.predict([[6.0, 2.2, 4.0, 1.0]])
```

Out[38]:

```
array(['Iris-versicolor'], dtype=object)
```

KNN Model

In [32]:

```
from sklearn.neighbors import KNeighborsClassifier
model = KNeighborsClassifier()
```

In [33]:

```
# training model
model.fit(X_train, y_train)
```

Out[33]:

```
▾ KNeighborsClassifier

KNeighborsClassifier()
```

In [34]:

```
# model accuracy
print("Accuracy : ", model.score(X_test, y_test) * 100)
```

```
Accuracy :  95.55555555555556
```

In [35]:

```
model.predict([[6.0, 2.2, 4.0, 1.0]])
```

Out[35]:

```
array(['Iris-versicolor'], dtype=object)
```

You can find this project on **GitHub.**