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Roll No: I081

Subject: Machine Learning

Practical: Practical 1

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```python
In [63]: import pandas as pd
         import numpy as np
         import matplotlib.pyplot as plt
         from sklearn.preprocessing import StandardScaler
         X = StandardScaler().fit_transform
```

```python
In [64]: df = pd.read_csv("Iris.csv")
```

```python
In [65]: df.head()
```

Out[65]:

	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

```python
In [66]: df.describe()
```

Out[66]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
count	150.000000	150.000000	150.000000	150.000000	150.000000
mean	75.500000	5.843333	3.054000	3.758667	1.198667
std	43.445368	0.828066	0.433594	1.764420	0.763161
min	1.000000	4.300000	2.000000	1.000000	0.100000
25%	38.250000	5.100000	2.800000	1.600000	0.300000
50%	75.500000	5.800000	3.000000	4.350000	1.300000
75%	112.750000	6.400000	3.300000	5.100000	1.800000
max	150.000000	7.900000	4.400000	6.900000	2.500000

In [67]:
```python
# Preprocessing the data set

# separate the features and the labels
# features should contain the four features sepal_length, sepal_width, pet
# labels should contain the name of the species, "species"
```

In [68]:
```python
df.shape
```

Out[68]: (150, 6)

In [69]:
```python
features = df.iloc[:,:-1].values
features
features.shape
```

Out[69]: (150, 5)

In [70]:
```python
labels = df.iloc[:,4].shape
```

In [71]:
```python
labels
```

Out[71]: (150,)

In [72]:
```python
# find if there are any missing values in the features

df = df.dropna()
```
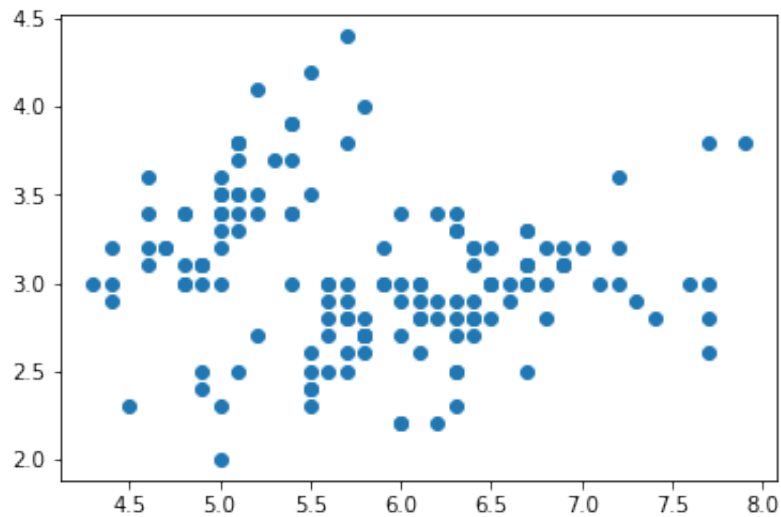
In [73]:
```python
df.shape

# there are no missing values present in the features
```

Out[73]: (150, 6)

In [74]:
```python
# plot the scatterplot for the features. (sepal_length vs sepal_width and 

plt.scatter(df['SepalLengthCm'], df['SepalWidthCm'])
```
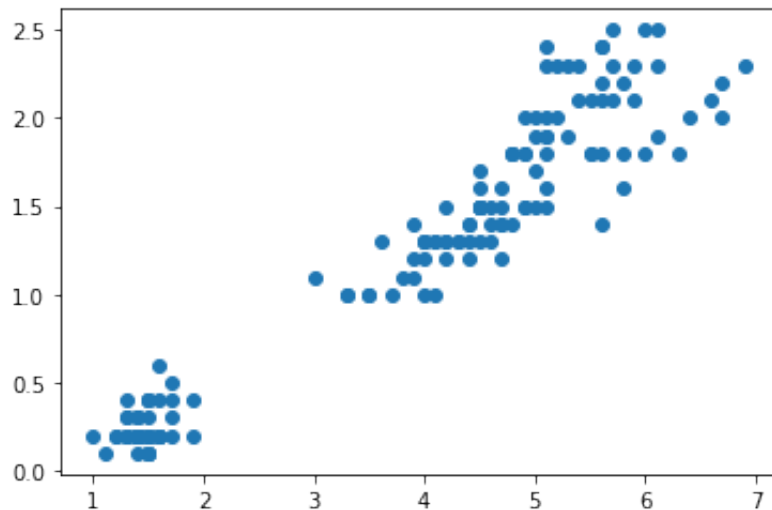
Out[74]: `<matplotlib.collections.PathCollection at 0x7f92d8c877f0>`

In [75]:
```python
plt.scatter(df['PetalLengthCm'], df['PetalWidthCm'])
```

Out[75]: `<matplotlib.collections.PathCollection at 0x7f92e84a39a0>`

In [76]:
```python
# scaling the features.

features = df.iloc[:,:-1]
scaler = StandardScaler()

# Standard Scaler follows Normal Distribution
# Therefore, it makes mean = 0 and scales the data to unit variance.

scaler.fit(features)

# Fit calculates the parameters or weights on the data.

features = scaler.transform(features)

# transform is transfroming all the features using respective mean and var.

features
```

```
Out[76]: array([[-1.72054204e+00, -9.00681170e-01,  1.03205722e+00,
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                  -1.34127240e+00, -1.31297673e+00],
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```

```
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