

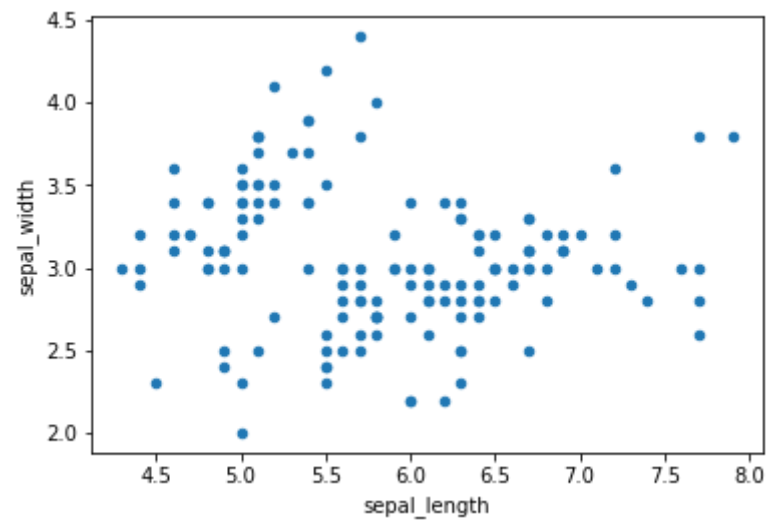
```
In [1]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
iris = pd.read_csv("IRIS.csv")
print(iris.head()) #prints first 5 values
```

	sepal_length	sepal_width	petal_length	petal_width	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

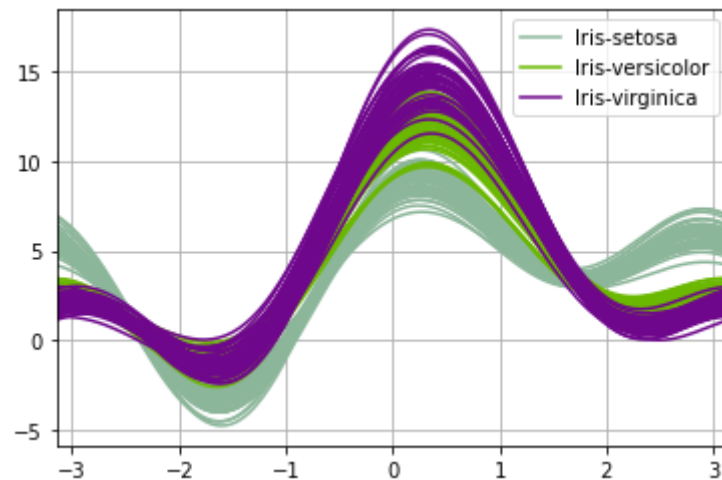
```
In [2]: print(iris.describe()) #prints some basic statistical data
```

	sepal_length	sepal_width	petal_length	petal_width
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 [3]: iris.plot(kind="scatter", x="sepal_length", y="sepal_width")  
plt.show()
```



```
In [4]: from pandas.plotting import andrews_curves
andrews_curves(iris.drop(index=1, axis=1), "species")
plt.show()
```



```
In [5]: from sklearn.model_selection import train_test_split
x = iris.iloc[:, :-1].values #last column values excluded
y = iris.iloc[:, -1].values #last column value
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.2,random_state=0)
```

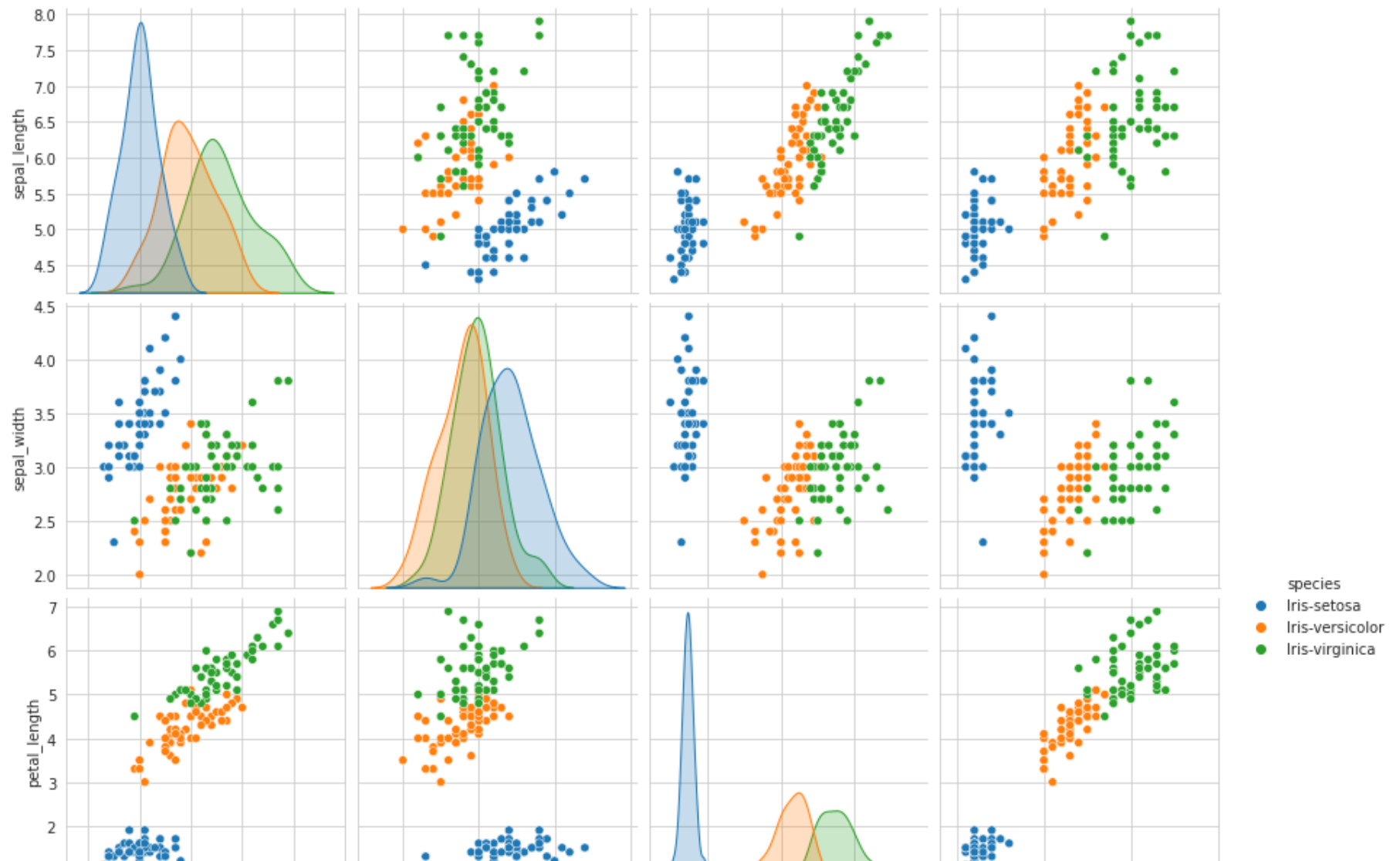
```
In [6]: from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score
```

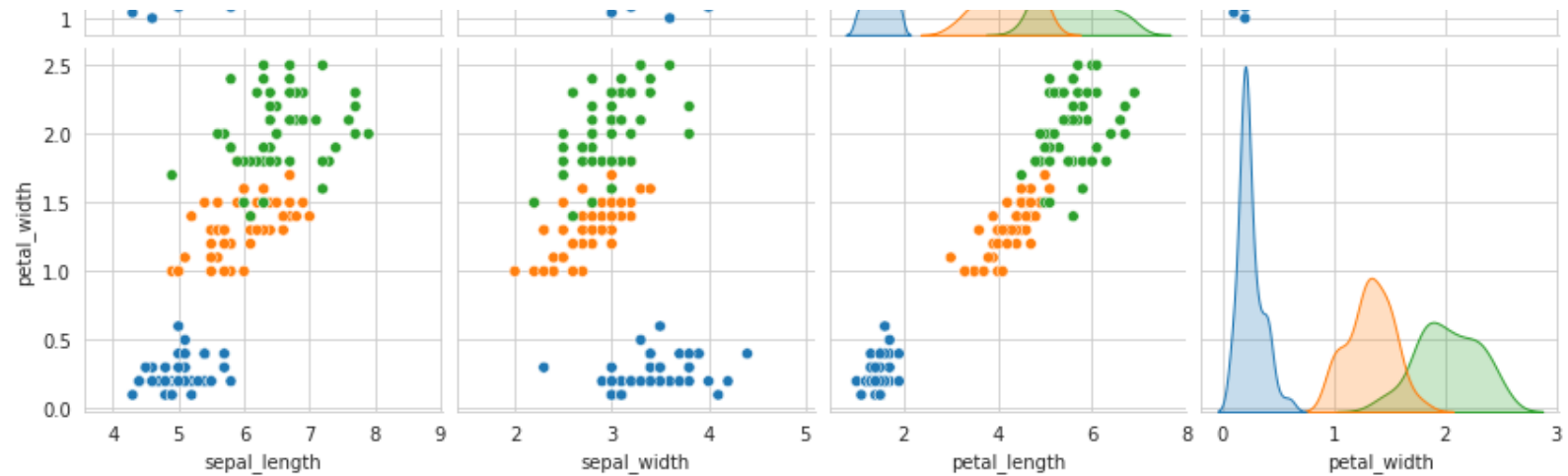
```
In [7]: classifier = DecisionTreeClassifier()
classifier.fit(x_train, y_train) #training the classifier
y_pred = classifier.predict(x_test) #making predictions
print('accuracy is', accuracy_score(y_pred, y_test)) #Accuracy score

accuracy is 1.0
```

```
In [17]: import seaborn as sns
sns.set_style("whitegrid")
sns.pairplot(iris,hue="species",size=3);
plt.show()
```

/home/praveen/anaconda3/lib/python3.8/site-packages/seaborn/axisgrid.py:1912: UserWarning: The `size` parameter has been renamed to `height`; please update your code.  
warnings.warn(msg, UserWarning)

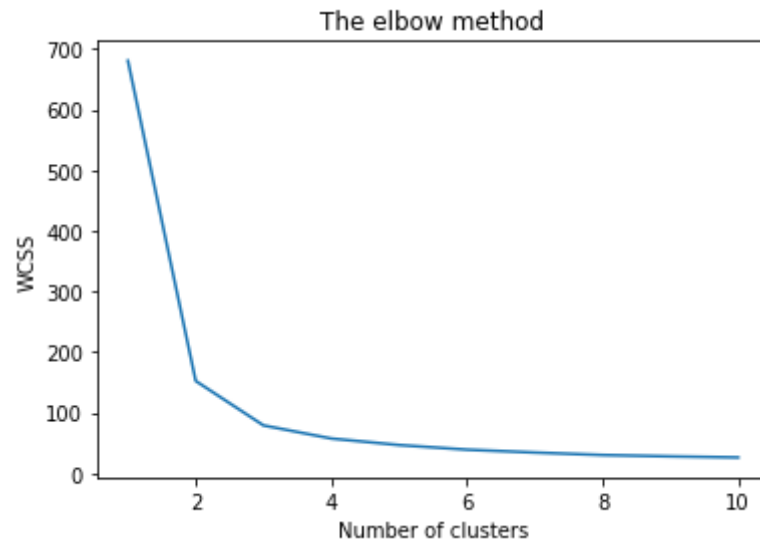




```
In [8]: from sklearn.cluster import KMeans
wcss = []

for i in range(1, 11):
    kmeans = KMeans(n_clusters = i, init = 'k-means++', max_iter = 300, n_init = 10, random_state = 0)
    kmeans.fit(x)
    wcss.append(kmeans.inertia_)
```

```
In [9]: plt.plot(range(1, 11), wcss)
plt.title('The elbow method')
plt.xlabel('Number of clusters')
plt.ylabel('WCSS') #within cluster sum of squares
plt.show()
```



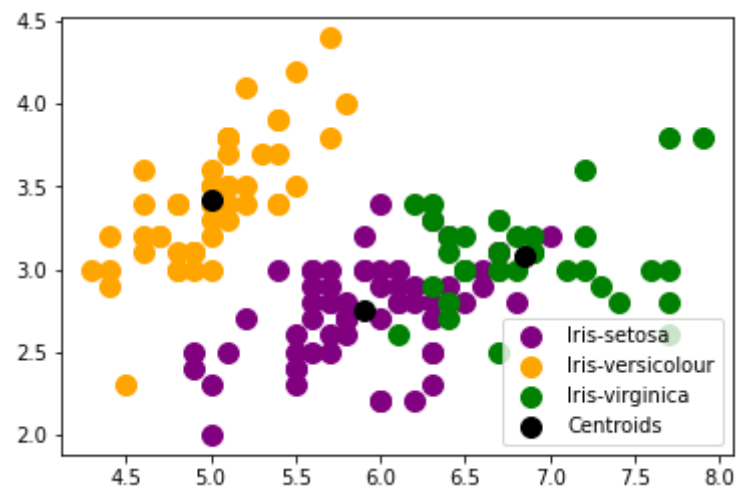
```
In [10]: kmeans = KMeans(n_clusters = 3, init = 'k-means++', max_iter = 300, n_init = 10, random_state = 0)
y_kmeans = kmeans.fit_predict(x)
```

```
In [12]: #Visualising the clusters
plt.scatter(x[y_kmeans == 0, 0], x[y_kmeans == 0, 1], s = 100, c = 'purple', label = 'Iris-setosa')
plt.scatter(x[y_kmeans == 1, 0], x[y_kmeans == 1, 1], s = 100, c = 'orange', label = 'Iris-versicolour')
plt.scatter(x[y_kmeans == 2, 0], x[y_kmeans == 2, 1], s = 100, c = 'green', label = 'Iris-virginica')

#Plotting the centroids of the clusters
plt.scatter(kmeans.cluster_centers[:, 0], kmeans.cluster_centers[:,1], s = 100, c = 'black', label = 'Centroids')

plt.legend()
```

Out[12]: <matplotlib.legend.Legend at 0x7f7e434337c0>



In [ ]: