```
#Dataset is "Iris"
```

Libraries

```
import numpy as np
import pandas as pd
import seaborn as sns
sns.set_palette('husl')
import matplotlib.pyplot as plt
%matplotlib inline

from sklearn import metrics
from sklearn.neighbors import KNeighborsClassifier
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
```

Load dataset

```
data = pd.read_csv('/content/Iris.csv')
```

```
data.head()
```

	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

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 6 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   Id             150 non-null    int64
 1   SepalLengthCm  150 non-null    float64
```

```
 2   SepalWidthCm   150 non-null    float64
 3   PetalLengthCm  150 non-null    float64
 4   PetalWidthCm   150 non-null    float64
 5   Species        150 non-null    object
dtypes: float64(4), int64(1), object(1)
memory usage: 7.2+ KB
```

```
data.describe()
```

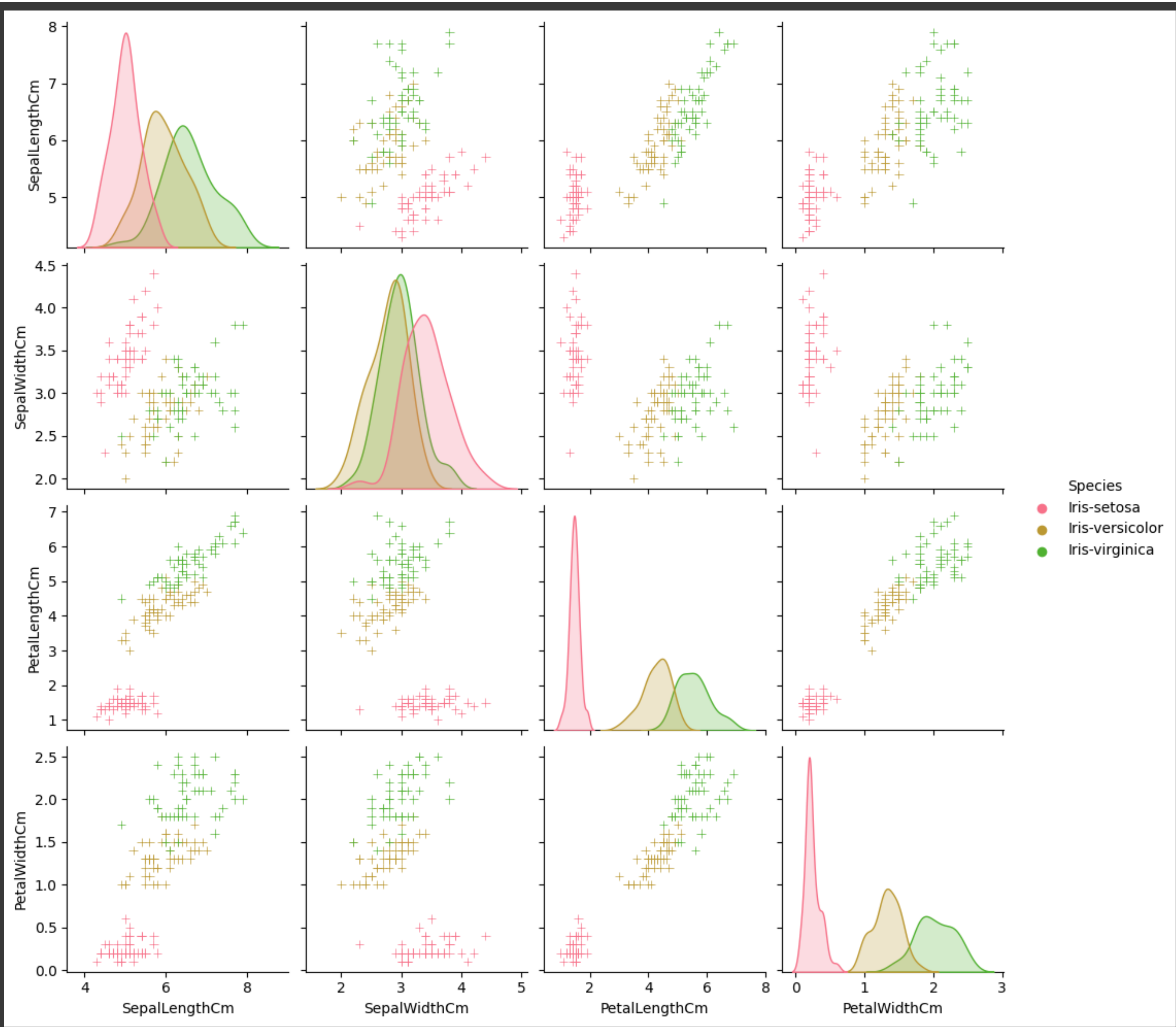
	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
count	150.000000	150.000000	150.000000	150.000000	150.000000
mean	75.500000	5.843333	3.054000	3.758667	1.198667
std	43.445368	0.828066	0.433594	1.764420	0.763161
min	1.000000	4.300000	2.000000	1.000000	0.100000
25%	38.250000	5.100000	2.800000	1.600000	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

```
data['Species'].value_counts()
```

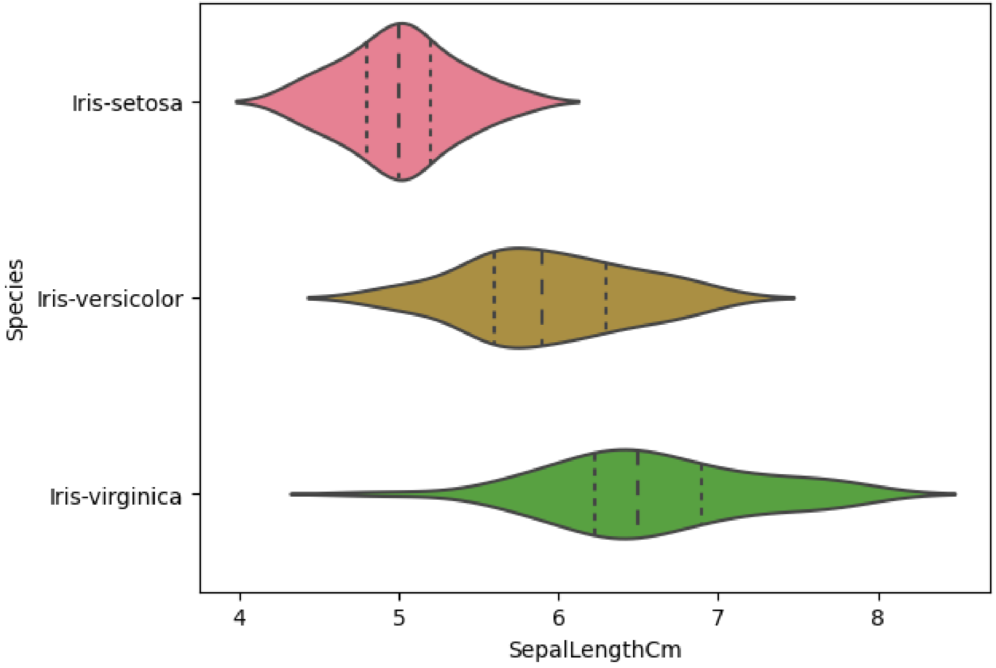
```
Iris-setosa        50
Iris-versicolor    50
Iris-virginica     50
Name: Species, dtype: int64
```

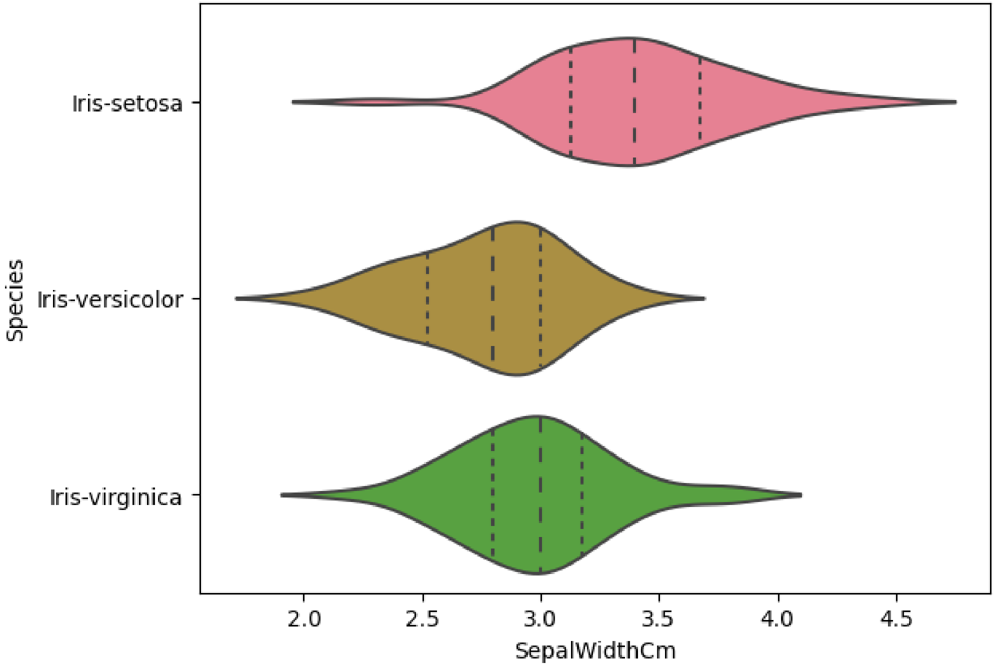
Data Visualisation

```
tmp = data.drop('Id', axis=1)
g = sns.pairplot(tmp, hue='Species', markers='+')
plt.show()
```


SepalLengthCm
SepalWidthCm
PetalLengthCm
PetalWidthCm
Species
Iris-setosa
Iris-versicolor
Iris-virginica

```
g = sns.violinplot(y='Species', x='SepalLengthCm', data=data, inner='quartile')
plt.show()
g = sns.violinplot(y='Species', x='SepalWidthCm', data=data, inner='quartile')
plt.show()
g = sns.violinplot(y='Species', x='PetalLengthCm', data=data, inner='quartile')
plt.show()
g = sns.violinplot(y='Species', x='PetalWidthCm', data=data, inner='quartile')
plt.show()
```


Iris-setosa
Iris-versicolor
Iris-virginica
Species
4
5
6
7
8
SepalLengthCm


Iris-setosa
Iris-versicolor
Iris-virginica
Species
2.0
2.5
3.0
3.5
4.0
4.5
SepalWidthCm

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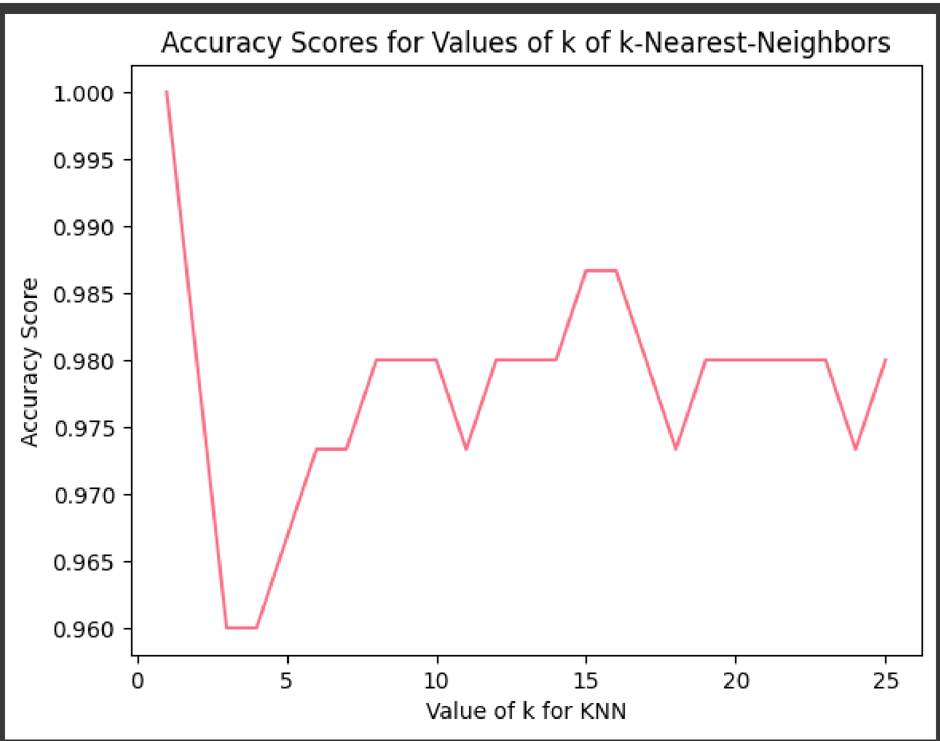
```
X = data.drop(['Id', 'Species'], axis=1)
y = data['Species']
# print(X.head())
print(X.shape)
# print(y.head())
print(y.shape)
```

```
(150, 4)
(150,)
```

Training and Testing

```
# experimenting with different n values
k_range = list(range(1,26))
scores = []
for k in k_range:
    knn = KNeighborsClassifier(n_neighbors=k)
    knn.fit(X, y)
    y_pred = knn.predict(X)
    scores.append(metrics.accuracy_score(y, y_pred))

plt.plot(k_range, scores)
plt.xlabel('Value of k for KNN')
plt.ylabel('Accuracy Score')
plt.title('Accuracy Scores for Values of k of k-Nearest-Neighbors')
plt.show()
```




```
logreg = LogisticRegression()
logreg.fit(X, y)
y_pred = logreg.predict(X)
print(metrics.accuracy_score(y, y_pred))
```

```
0.9733333333333334
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.4, random_state=5)
print(X_train.shape)
print(y_train.shape)
print(X_test.shape)
print(y_test.shape)
```

```
(90, 4)
(90,)
(60, 4)
(60,)
```

```
# experimenting with different n values
k_range = list(range(1,26))
scores = []
for k in k_range:
    knn = KNeighborsClassifier(n_neighbors=k)
    knn.fit(X_train, y_train)
    y_pred = knn.predict(X_test)
    scores.append(metrics.accuracy_score(y_test, y_pred))

plt.plot(k_range, scores)
plt.xlabel('Value of k for KNN')
plt.ylabel('Accuracy Score')
plt.title('Accuracy Scores for Values of k of k-Nearest-Neighbors')
plt.show()
```