```
pip install pandas numpy scikit-learn matplotlib seaborn
```

```
Requirement already satisfied: pandas in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: numpy in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.12/dist-pa
Requirement already satisfied: matplotlib in /usr/local/lib/python3.12/dist-pack
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Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.12/dis
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Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.12/di
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Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.12/dist
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```

```
#Importing libraries
```

```
import pandas as pd
```

```
import numpy as np
```

```
import matplotlib.pyplot as plt
```

```
import seaborn as sns
```

```
from sklearn.model_selection import train_test_split
```

```
from sklearn.preprocessing import StandardScaler
```

```
from sklearn.neighbors import KNeighborsClassifier
```

```
from sklearn.metrics import accuracy_score, classification_report, confusion_ma
```

```
df = pd.read_csv("Iris.csv")
```

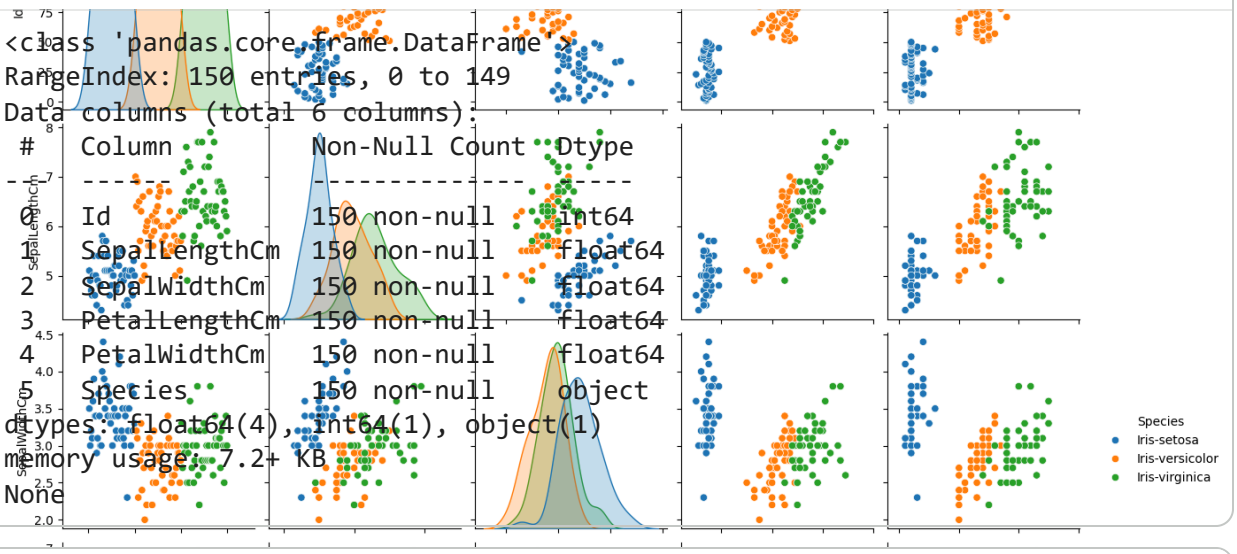
```
print(df.head())
```

```
   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
```

```
(sns.pairplot(df, hue='Species'))
```

```
<seaborn.axisgrid.PairGrid at 0x7c287f7dd520>
```

```
print(df.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
None
```

```
print(df['Species'].value_counts())
```

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

```
print(df.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

```
X = df.drop('Species', axis=1)
y = df['Species']
```

```
#Split Data into Train and Test
```

```
X_train, X_test, y_train, y_test = train_test_split(
    X, y, test_size=0.2, random_state=42
)
```

```
#Feature Scaling
```

```
scaler = StandardScaler()

X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)
```

```
#Training the Model
```

```
model = KNeighborsClassifier(n_neighbors=3)

model.fit(X_train, y_train)
```

```
KNeighborsClassifier
KNeighborsClassifier(n_neighbors=3)
```

```
#Predictions
```

```
y_pred = model.predict(X_test)
```

```
#Evaluate Model Performance
```

```
#Accuracy
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

```
Accuracy: 1.0
```

```
# Classification Report
print(classification_report(y_test, y_pred))
```

```
                precision    recall  f1-score   support

    Iris-setosa       1.00      1.00      1.00        10
Iris-versicolor       1.00      1.00      1.00         9
 Iris-virginica       1.00      1.00      1.00        11

       accuracy                           1.00        30
      macro avg       1.00      1.00      1.00        30
   weighted avg       1.00      1.00      1.00        30
```

```
#Confusion Matrix
cm = confusion_matrix(y_test, y_pred)
```

```
sns.heatmap(cm, annot=True, fmt='d')
plt.xlabel("Predicted")
plt.ylabel("Actual")
```