```
import seaborn as sns import pandas as pd import
matplotlib.pyplot as plt from sklearn.model_selection import
train_test_split

df = sns.load_dataset('iris')

print("Original DataFrame:") print(df.head())
print("\n" +
"="*50 + "\n")

# Features and target variables
X = df.drop('species', axis=1)
Y = df['species']

# Split the data into training and testing sets
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.2, random_state=42)

# Displaying the results print("Training and
Testing Data Split:") print("\n" +
"="*50 + "\n")

print("Y_train (Training Labels):") print(Y_train.head())  print("\n"
+ "="*50 + "\n")

print("Y_test (Testing Labels):") print(Y_test.head())
```

```
# Visualizing the Iris dataset

# Plotting the original Iris data (sepal_length vs sepal_width)
plt.figure(figsize=(8, 5)) sns.scatterplot(x=df['sepal_length'], y=df['sepal_width'],
hue=df['species'], palette='Set1', s=100) plt.title('Iris Dataset: Sepal Length vs
Sepal Width') plt.xlabel('Sepal Length') plt.ylabel('Sepal Width')
plt.legend(title='Species') plt.show()

# Plotting the training set plt.figure(figsize=(8, 5))
sns.scatterplot(x=X_train['sepal_length'], y=X_train['sepal_width'], hue=Y_train,
palette='Set1', s=100) plt.title('Training Set: Sepal Length vs Sepal Width')
plt.xlabel('Sepal Length') plt.ylabel('Sepal Width') plt.legend(title='Species')
plt.show()

# Plotting the testing set plt.figure(figsize=(8, 5))
sns.scatterplot(x=X_test['sepal_length'],
y=X_test['sepal_width'], hue=Y_test,
palette='Set1', s=100) plt.title('Testing Set:
Sepal Length vs Sepal Width') plt.xlabel('Sepal Length')
plt.ylabel('Sepal Width') plt.legend(title='Species')
plt.show()

Original DataFrame:    sepal_length  sepal_width  petal_length
petal_width species
0        5.1         3.5          1.4         0.2  setosa
1        4.9         3.0          1.4         0.2  setosa
2        4.7         3.2          1.3         0.2  setosa
```

3 4.6 3.1 1.5 0.2 setosa 4 5.0 3.6 1.4

0.2 setosa

==========

Training and Testing Data Split:

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Y_train (Training Labels):

22 setosa

15 setosa

65 versicolor

11 setosa

42 setosa

Name: species, dtype: object

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Y_test (Testing Labels):

73 versicolor

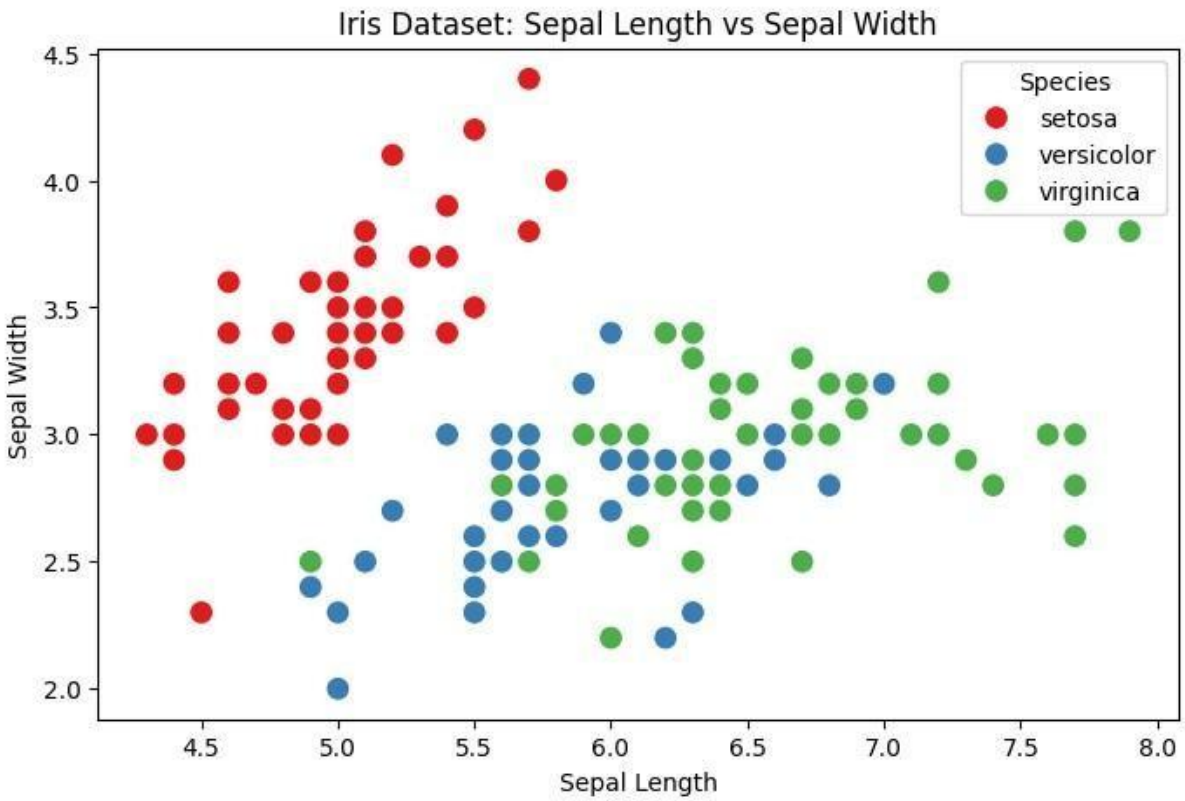
18 setosa

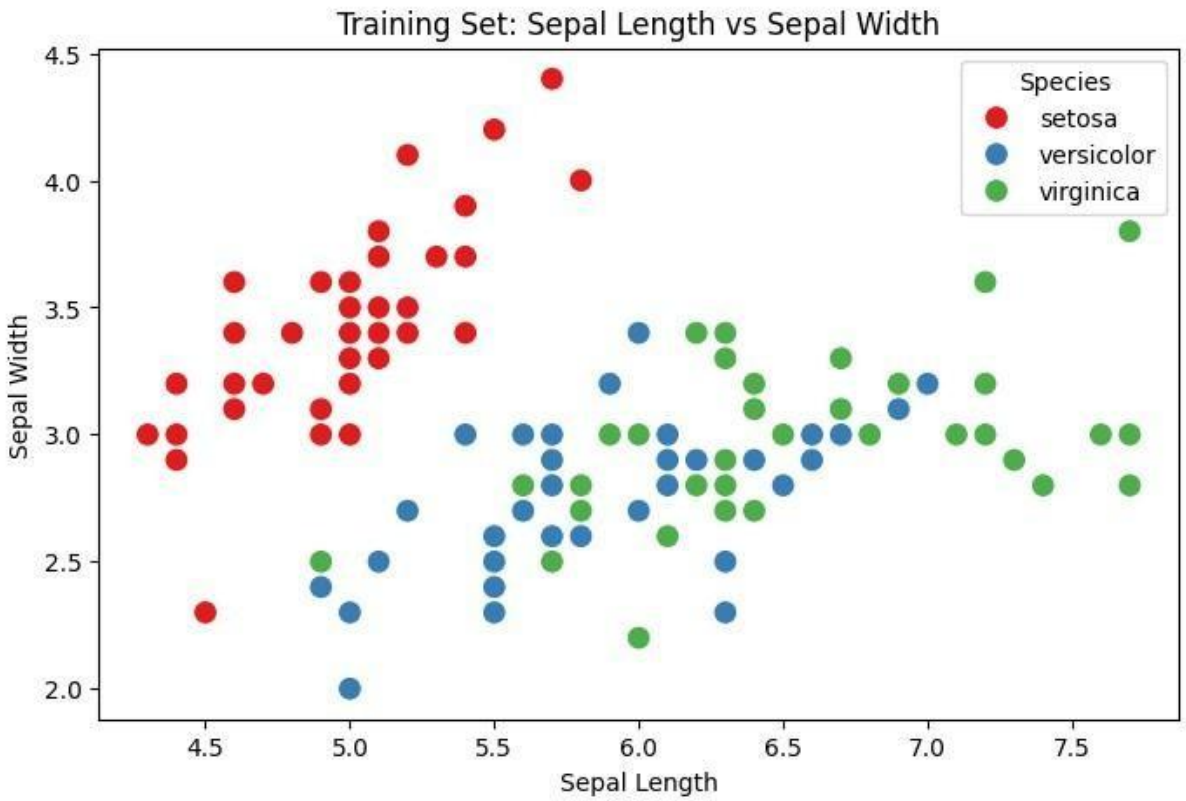
118 virginica

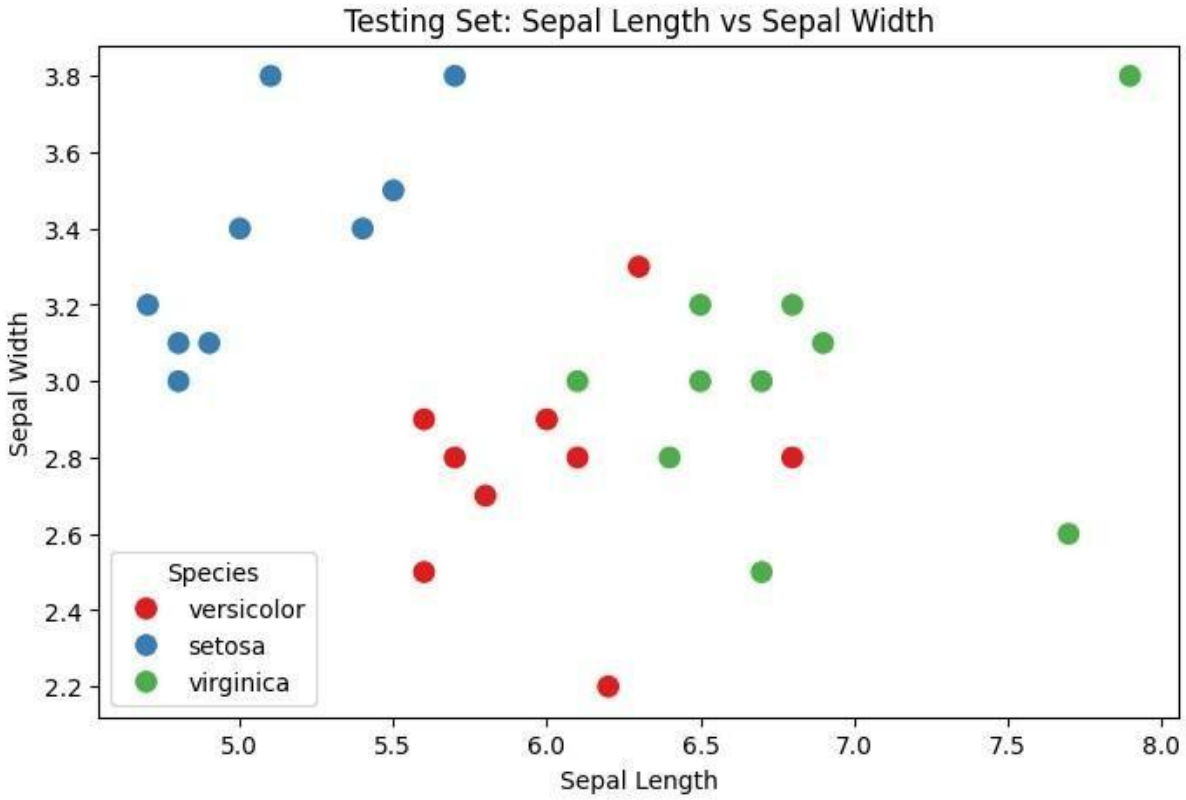
78 versicolor

76 versicolor

Name: species, dtype: object


Iris Dataset: Sepal Length vs Sepal Width
Species
setosa
versicolor
virginica
Sepal Width
Sepal Length
4.5
4.0
3.5
3.0
2.5
2.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0


Training Set: Sepal Length vs Sepal Width
Species
setosa
versicolor
virginica
Sepal Width
Sepal Length
4.5
4.0
3.5
3.0
2.5
2.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5


Testing Set: Sepal Length vs Sepal Width
Species
versicolor
setosa
virginica
Sepal Width
Sepal Length
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
5.0
5.5
6.0
6.5
7.0
7.5
8.0