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## # *Week 7*

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# General Statistics Plot (Matplotlib or Seaborn):

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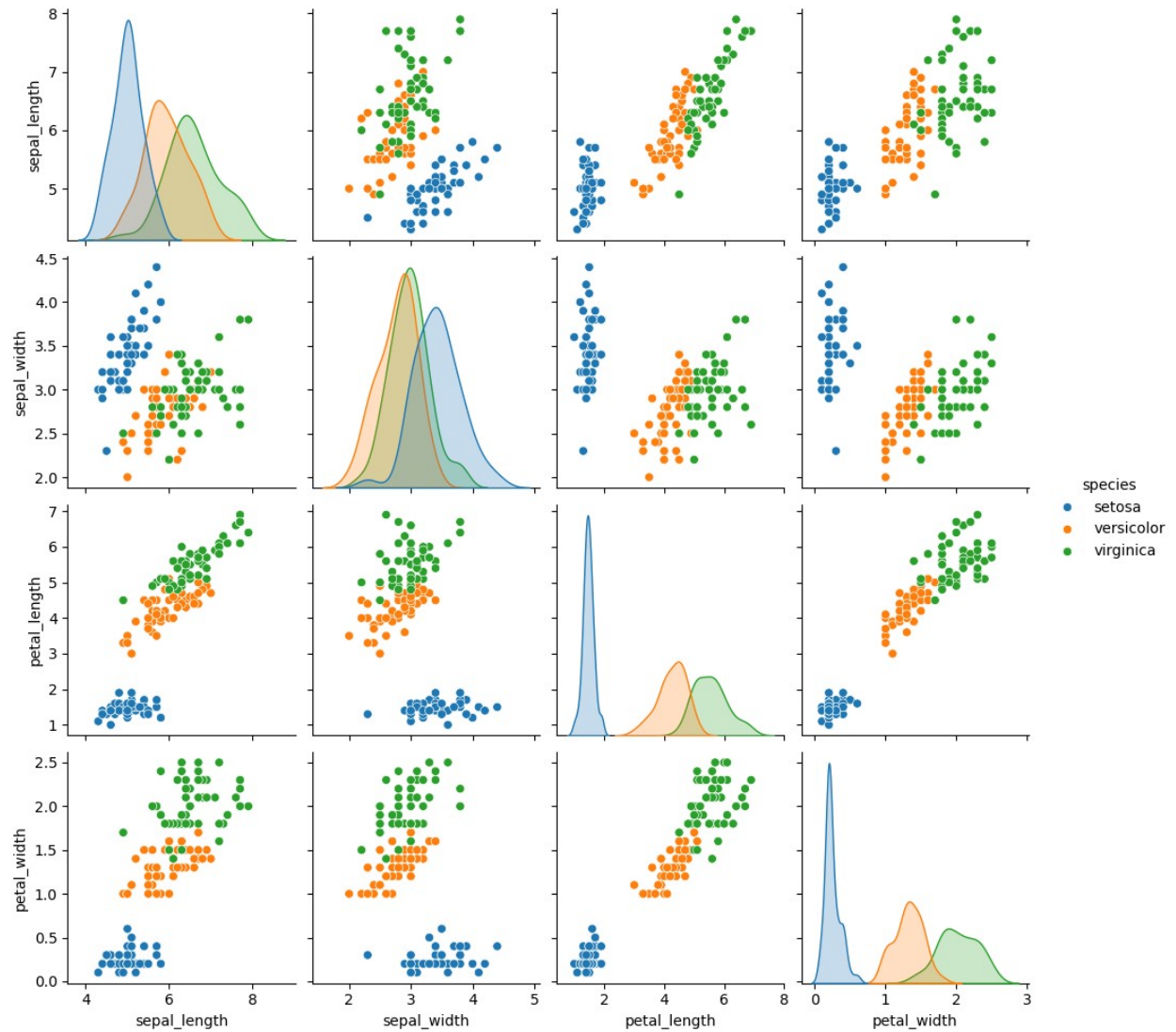
Write a Python program to create a plot that gives a general statistical summary of the Iris data. You can use seaborn's pairplot or pandas' describe() for guidance.

```
import seaborn as sns
import matplotlib.pyplot as plt
import pandas as pd

# Load the Iris dataset
iris = sns.load_dataset('iris')

# Create a pairplot to visualize relationships between features
sns.pairplot(iris, hue='species')
plt.show()

# Display descriptive statistics
print(iris.describe())
```



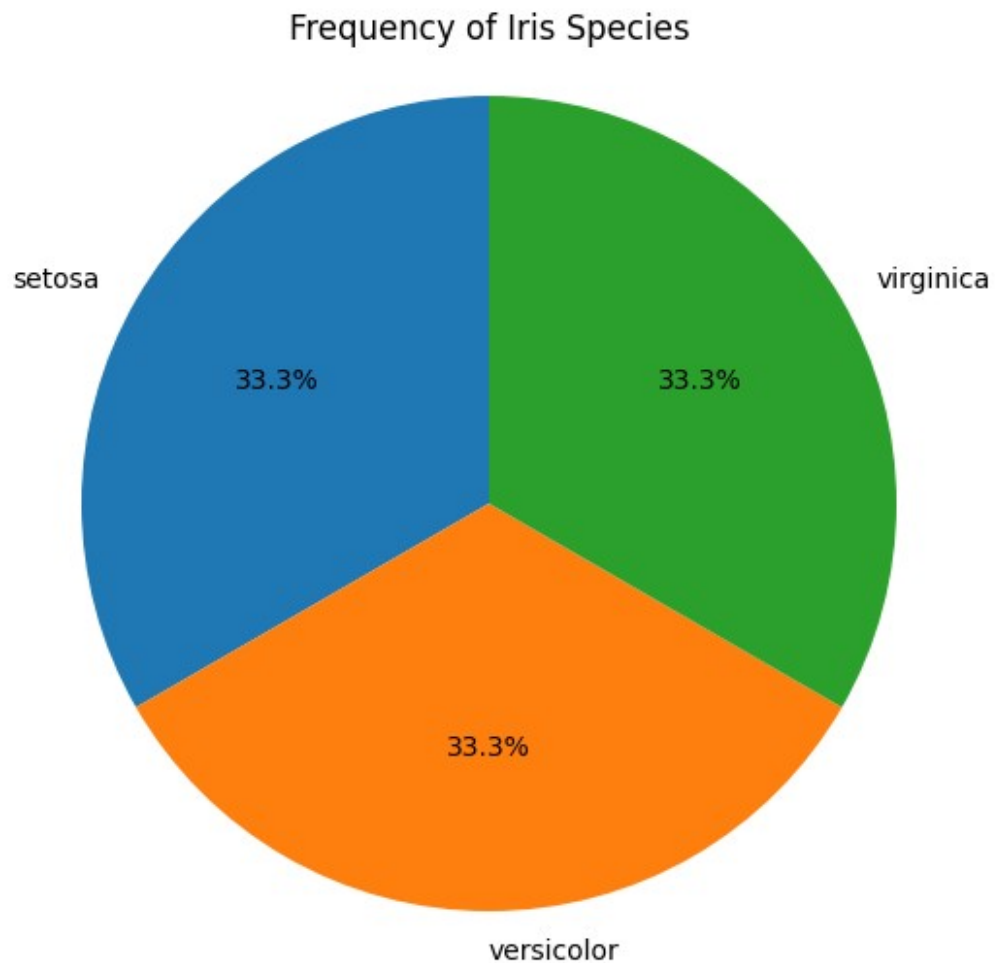
	sepal_length	sepal_width	petal_length	petal_width
count	150.000000	150.000000	150.000000	150.000000
mean	5.843333	3.057333	3.758000	1.199333
std	0.828066	0.435866	1.765298	0.762238
min	4.300000	2.000000	1.000000	0.100000
25%	5.100000	2.800000	1.600000	0.300000
50%	5.800000	3.000000	4.350000	1.300000
75%	6.400000	3.300000	5.100000	1.800000
max	7.900000	4.400000	6.900000	2.500000

## Pie Plot for Species Frequency:

Write a Python program to create a pie chart to display the frequency of the three species (setosa, versicolor, virginica) in the Iris dataset.

```
# Count the occurrences of each species
species_counts = iris['species'].value_counts()

# Create the pie chart
plt.figure(figsize=(8, 6))
plt.pie(species_counts, labels=species_counts.index, autopct='%1.1f%%', startangle=90)
plt.title('Frequency of Iris Species')
plt.axis('equal') # Equal aspect ratio ensures that pie is drawn as a circle.
plt.show()
```

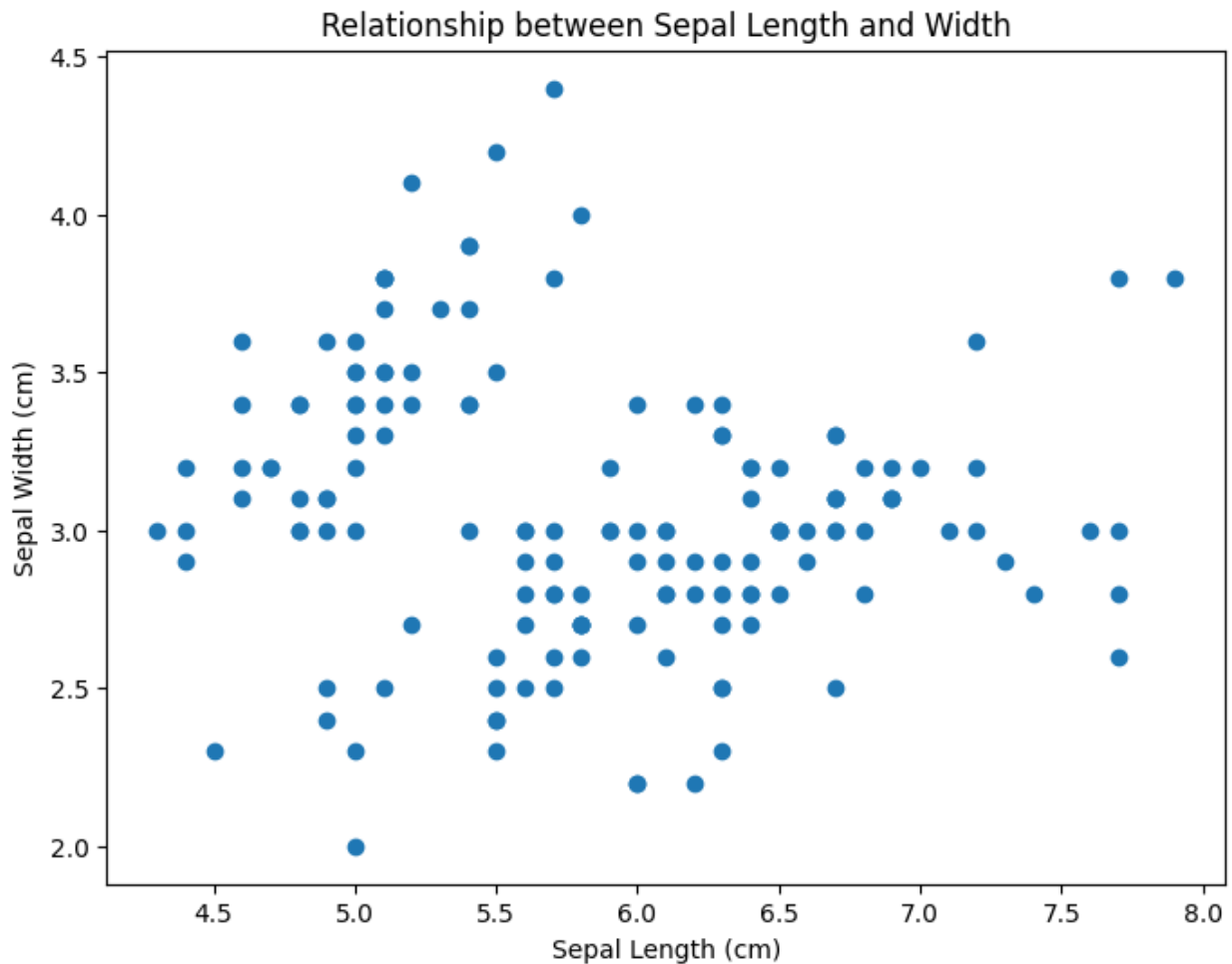


# Relationship Between Sepal Length and Width:

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Write a Python program to create a scatter plot to find the relationship between sepal length and sepal width for the Iris dataset.

```
# Create the scatter plot
plt.figure(figsize=(8, 6))
plt.scatter(iris['sepal_length'], iris['sepal_width'])
plt.xlabel('Sepal Length (cm)')
plt.ylabel('Sepal Width (cm)')
plt.title('Relationship between Sepal Length and Width')
plt.show()
```



## ----- # Week 8

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### # Distribution of Sepal and Petal Features:

Write a Python program to create a plot that shows how the length and width of sepal length, sepal width, petal length, and petal width are distributed. **bold text**

```
# Create histograms for each feature
plt.figure(figsize=(12, 8))

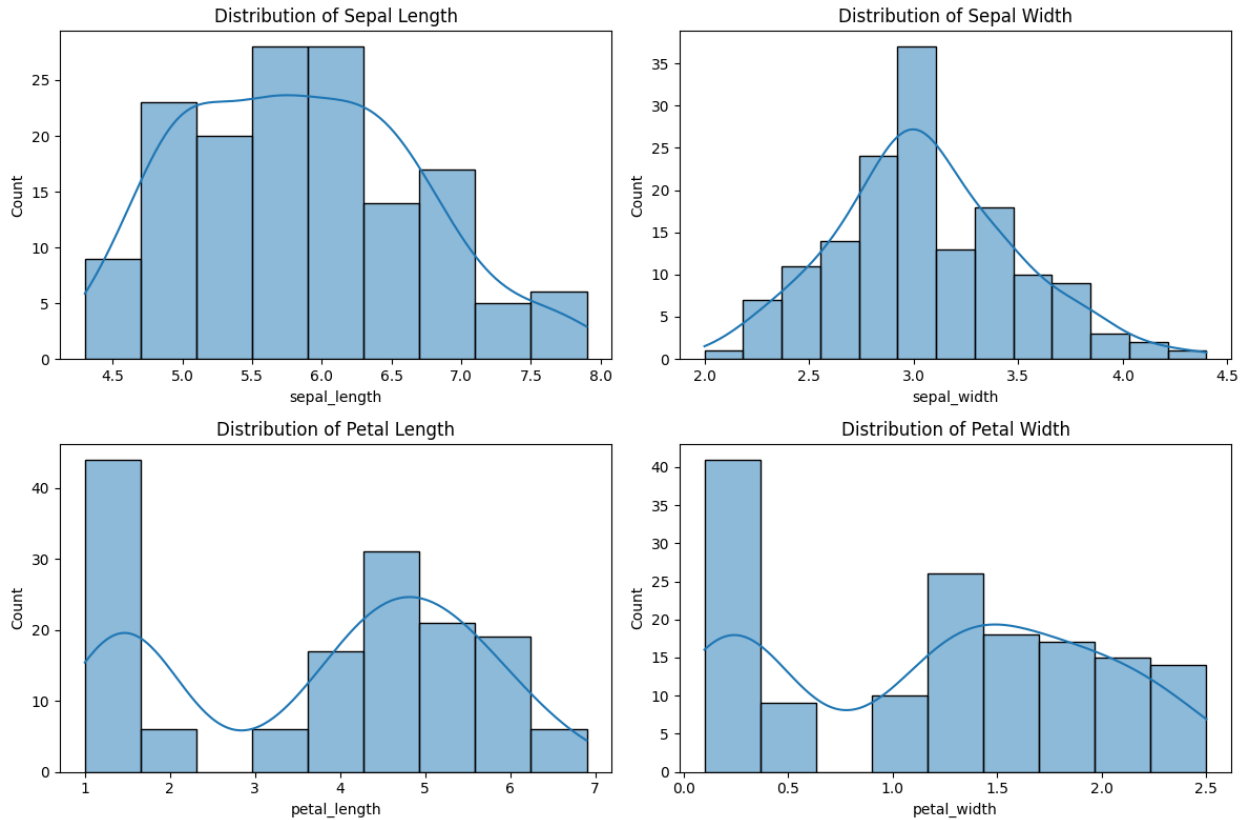
plt.subplot(2, 2, 1)
sns.histplot(iris['sepal_length'], kde=True)
plt.title('Distribution of Sepal Length')

plt.subplot(2, 2, 2)
sns.histplot(iris['sepal_width'], kde=True)
plt.title('Distribution of Sepal Width')

plt.subplot(2, 2, 3)
sns.histplot(iris['petal_length'], kde=True)
plt.title('Distribution of Petal Length')

plt.subplot(2, 2, 4)
sns.histplot(iris['petal_width'], kde=True)
plt.title('Distribution of Petal Width')

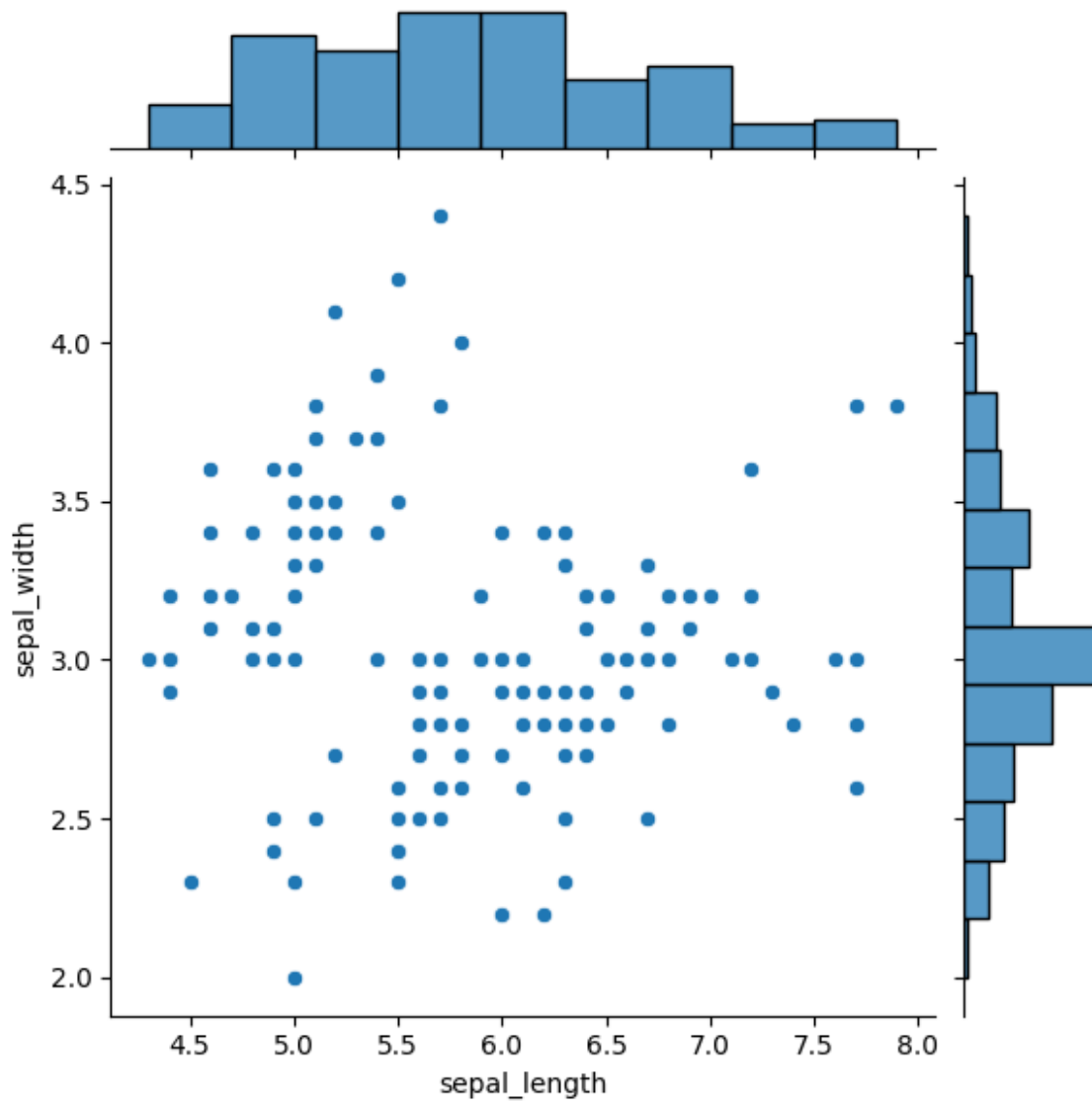
plt.tight_layout()
plt.show()
```



## # Jointplot of Sepal Length vs Sepal Width:

Write a Python program to create a joint plot to describe the individual distributions on the same plot between sepal length and sepal width.

```
sns.jointplot(x='sepal_length', y='sepal_width', data=iris)
plt.show()
```



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## KDE Plot for Setosa Species (Sepal Length vs Sepal Width):

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Write a Python program using seaborn to create a KDE (Kernel Density Estimate) plot of sepal length versus sepal width for the setosa species of the Iris dataset.

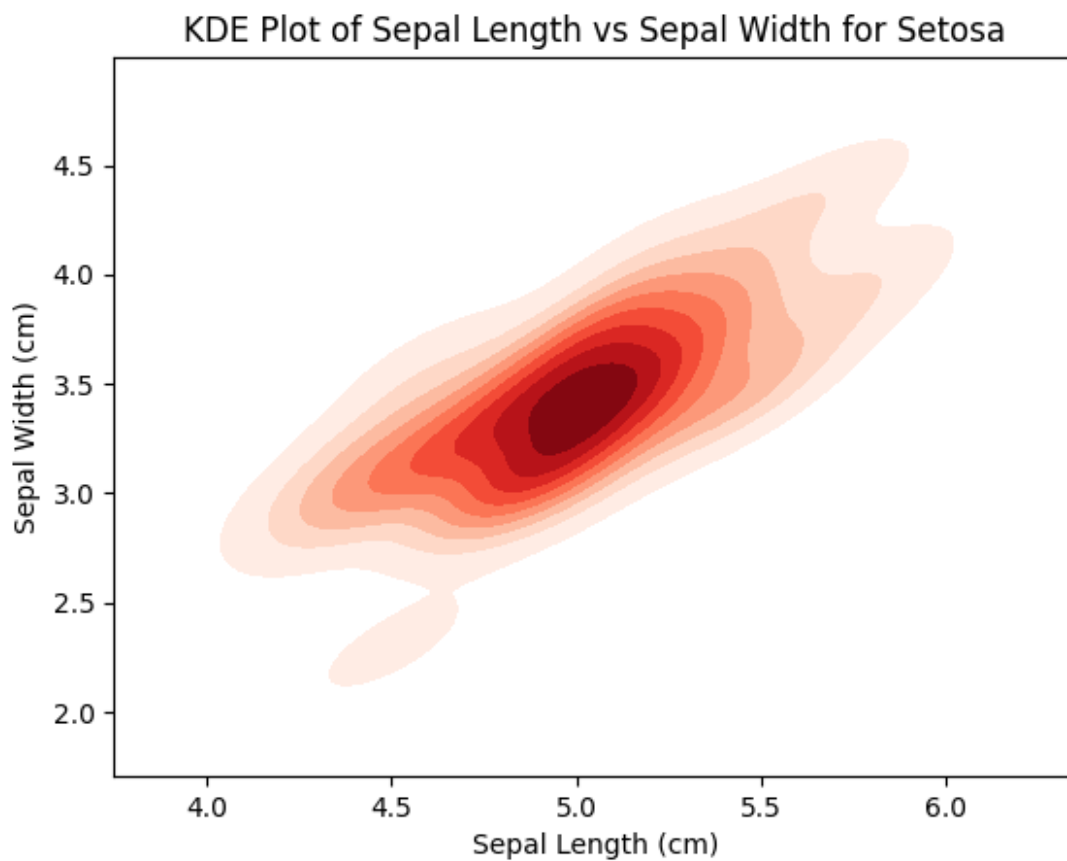
```
# Filter the dataset for setosa species
setosa = iris[iris['species'] == 'setosa']
```

```
# Create the KDE plot
sns.kdeplot(data=setosa, x='sepal_length', y='sepal_width',
            cmap="Reds", shade=True)
plt.xlabel('Sepal Length (cm)')
plt.ylabel('Sepal Width (cm)')
plt.title('KDE Plot of Sepal Length vs Sepal Width for Setosa')
plt.show()
```

<ipython-input-17-fe0ed3dd978d>:5: FutureWarning:

`shade` is now deprecated in favor of `fill`; setting `fill=True`.  
This will become an error in seaborn v0.14.0; please update your code.

```
sns.kdeplot(data=setosa, x='sepal_length', y='sepal_width',
            cmap="Reds", fill=True)
```





# SKDE Plot for Setosa Species (Petal Length vs Petal Width):

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Write a Python program using seaborn to create a KDE plot of petal length versus petal width for the setosa species.

```
# Filter the dataset for setosa species
setosa = iris[iris['species'] == 'setosa']

# Create the KDE plot
sns.kdeplot(data=setosa, x='petal_length', y='petal_width',
            cmap="Reds", shade=True)
plt.xlabel('Petal Length (cm)')
plt.ylabel('Petal Width (cm)')
plt.title('KDE Plot of Petal Length vs Petal Width for Setosa')
plt.show()
```

<ipython-input-18-393e694af586>:5: FutureWarning:

`shade` is now deprecated in favor of `fill`; setting `fill=True`.  
This will become an error in seaborn v0.14.0; please update your code.

```
sns.kdeplot(data=setosa, x='petal_length', y='petal_width',
            cmap="Reds", shade=True)
```

KDE Plot of Petal Length vs Petal Width for Setosa

