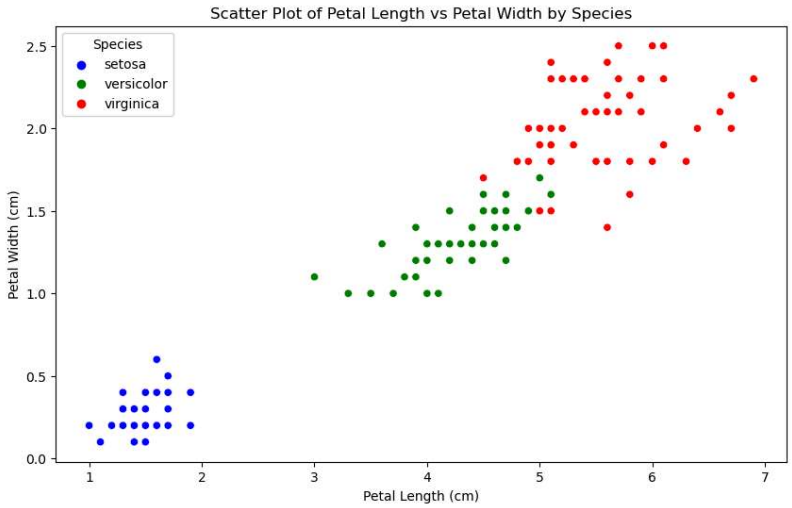
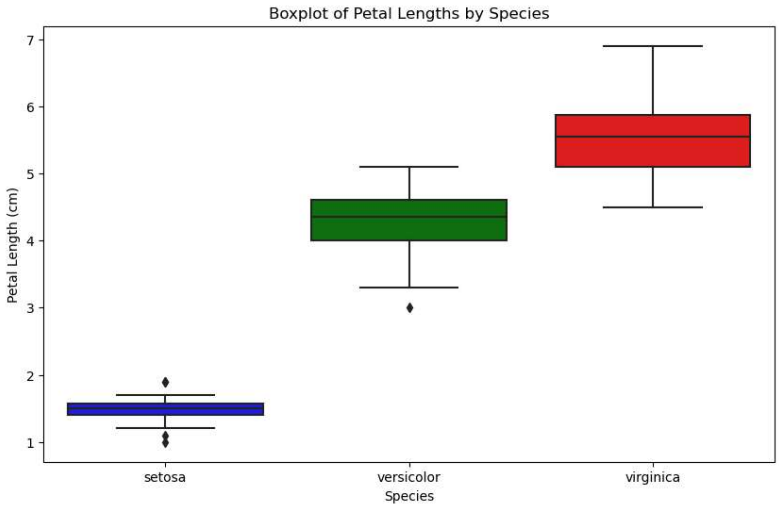
In [6]:
```
#1

#Q:Create a scatterplot to visualize petal length and petal width by species
#title
#legend with a title
#Labeled 'x' and 'y' axes
#Custom colors
#Include a short summary of your findings


#A:
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

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

# Scatter plot with customizations
plt.figure(figsize=(10, 6))
scatter = sns.scatterplot(x='petal_length', y='petal_width', hue='species', palette={'setosa': 'blue', 'versicolor': 'green', 'virginica': 'red'}, data=iris)
plt.title('Scatter Plot of Petal Length vs Petal Width by Species')
plt.xlabel('Petal Length (cm)')
plt.ylabel('Petal Width (cm)')
plt.legend(title='Species')
plt.show()
```



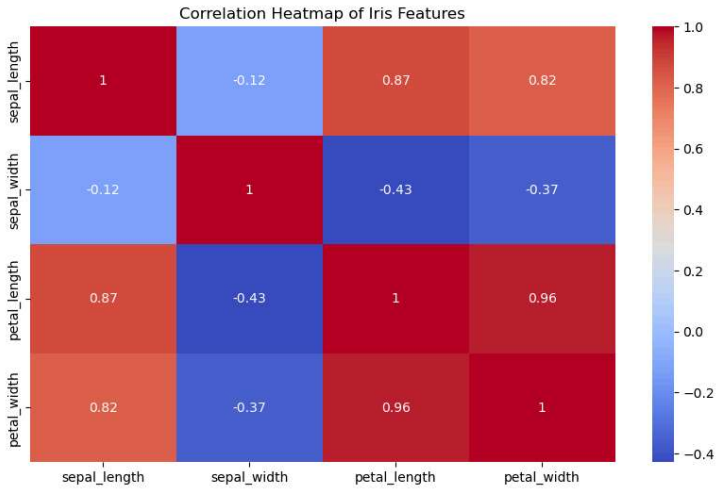
In [ ]:
```
#Summary of Findings:
#The data points for Iris setosa (blue) are clustered in the lower-left corner of the plot
#This indicates that setosa flowers tend to have smaller petal lengths and widths compared
#to the other species.The data points for Iris versicolor (green) are spread out in the middle
#of the plot. Versicolor flowers generally have intermediate petal lengths and widths.
#The data points for Iris virginica (red) are located in the upper-right corner of the plot
```

In [8]:
```
#2

#Q:Create a boxplot showing the petal lengths for all three species
#title
#Labeled 'x' and 'y' axes
#Custom colors
#Include a short summary of your findings


#A:
import seaborn as sns
import matplotlib.pyplot as plt

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

# Boxplot with customizations
plt.figure(figsize=(10, 6))
boxplot = sns.boxplot(x='species', y='petal_length', palette={'setosa': 'blue', 'versicolor': 'green', 'virginica': 'red'}, data=iris)
plt.title('Boxplot of Petal Lengths by Species')
plt.xlabel('Species')
plt.ylabel('Petal Length (cm)')
plt.show()
```



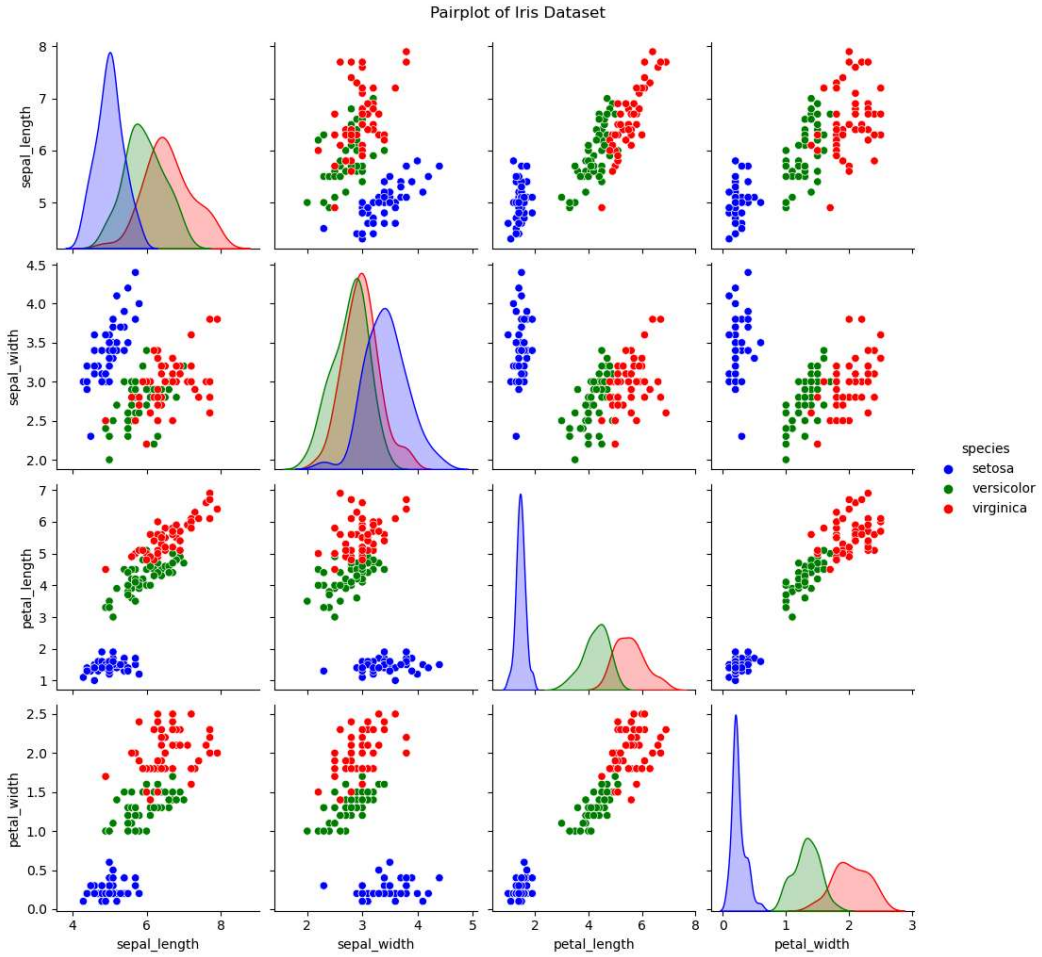
In [ ]:
```
#Summary of Findings:
#The petal lengths for Iris setosa (blue) are significantly smaller compared to the other
#species.The median petal length is around 1.5 cm, and there is very little variation in
#the petal lengths of this species
# The petal lengths for Iris versicolor (green) are intermediate, with a median petal length
#of around 4.35 cm. The variation in petal length is moderate compared to setosa and virginica
```

In [9]:
```
#3

#Q:Create a heatmap illustrating correlation between all the features
#title
#Custom colors
#Include a short summary of your findings


#A:
import seaborn as sns
import matplotlib.pyplot as plt

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

# Calculate the correlation matrix
correlation_matrix = iris.corr()

# Heatmap with customizations
plt.figure(figsize=(10, 6))
heatmap = sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm', cbar=True)
plt.title('Correlation Heatmap of Iris Features')
```



In [10]:
```
#Summary of Findings:
#Petal length and petal width have a very strong positive correlation (0.96)
#This means that as petal length increases, petal width tends to increase as well
#Petal length also shows a strong positive correlation with sepal length (0.87),
#indicating that flowers with longer petals generally have longer sepals
#Sepal length and petal width have a moderate positive correlation (0.82),
#indicating a relationship where flowers with longer sepals tend to have wider petalS
#Sepal length and sepal width have a moderate positive correlation (0.78), suggesting
#that flowers with longer sepals also tend to have wider sepals
#Sepal width and petal length show a weak positive correlation (0.56), indicating that
#sepal width has a lesser impact on petal length.
```

In [11]:
```
#4

#Q:Create a pairplot to plot pairwise relationships between iris dataset variable
#title
#Custom colors
#Include a short summary of your findings

#A:
import seaborn as sns
import matplotlib.pyplot as plt

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

# Pairplot with custom colors
pairplot = sns.pairplot(iris, hue='species', palette={'setosa': 'blue', 'versicolor': 'green', 'virginica': 'red'})
pairplot.fig.suptitle('Pairplot of Iris Dataset', y=1.02)  # y=1.02 to make space for the title
```



In [ ]:
```
#Summary of Findings:
#The pairplot shows a clear separation between the three species of Iris (setosa, versicolor, and virginica)
#based on the different feature pairs. Setosa is the most distinct, clustering separately in most plots
#The scatter plots of petal length vs. petal width show a strong separation between the species
#Setosa has the smallest petal dimensions, while virginica has the largest, with versicolor in between
#Sepal length and width do not separate the species as distinctly as the petal dimensions do.
#However, setosa shows a more distinct cluster with wider sepals.
```