In [3]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import warnings
warnings.simplefilter('ignore')
df=pd.read_csv(r"C:\Users\HP\Downloads\New folder\1) iris (1).csv")
df
```

Out[3]:

	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
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

150 rows × 5 columns

In [4]:
```
df.isnull()
```

Out[4]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
...	...	...	...	...	...
145	False	False	False	False	False
146	False	False	False	False	False
147	False	False	False	False	False
148	False	False	False	False	False
149	False	False	False	False	False

150 rows × 5 columns

In [5]:
```
df.describe()
```

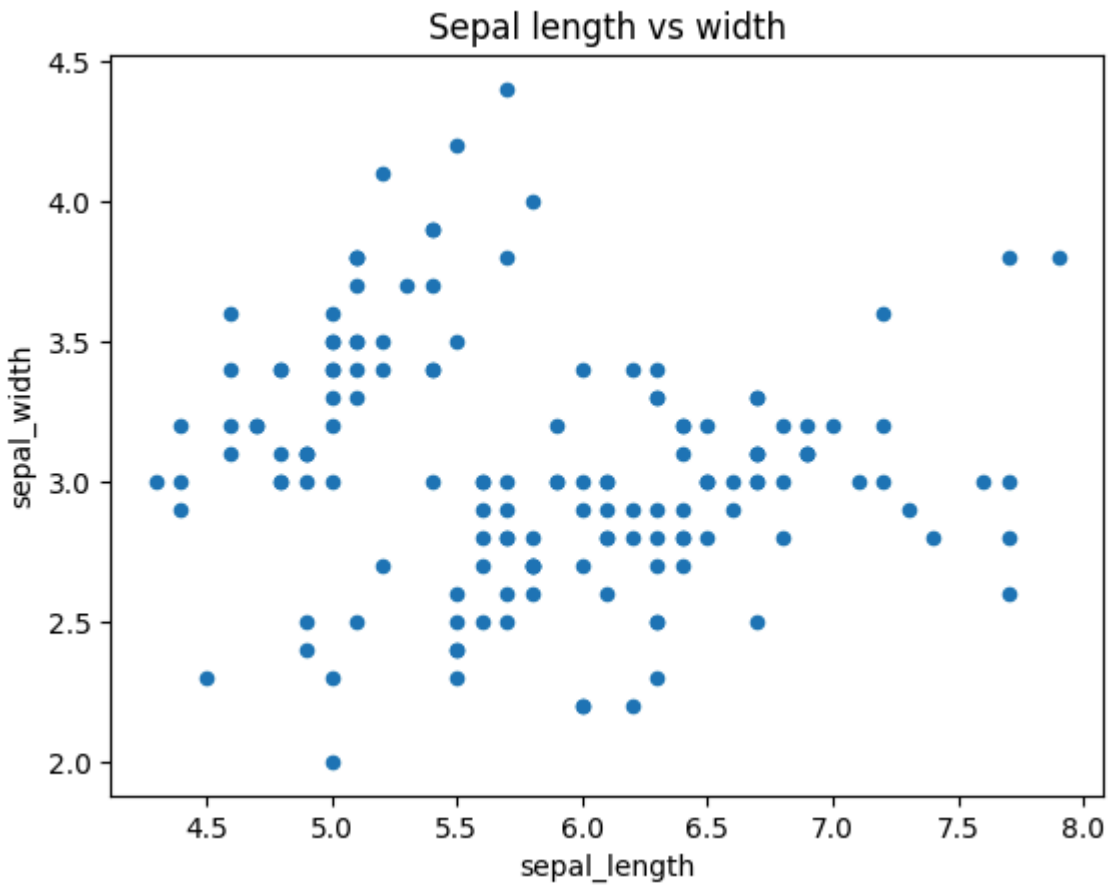
Out[5]:

	sepal_length	sepal_width	petal_length	petal_width
count	150.000000	150.000000	150.000000	150.000000
mean	5.843333	3.054000	3.758667	1.198667
std	0.828066	0.433594	1.764420	0.763161
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

In [6]:
```
df.isnull().sum()
```

Out[6]:
```
sepal_length    0
sepal_width     0
petal_length    0
petal_width     0
species         0
dtype: int64
```

In [7]:
```
df.plot(kind="scatter", x="sepal_length", y="sepal_width", title="Sepal length v
plt.show()
```



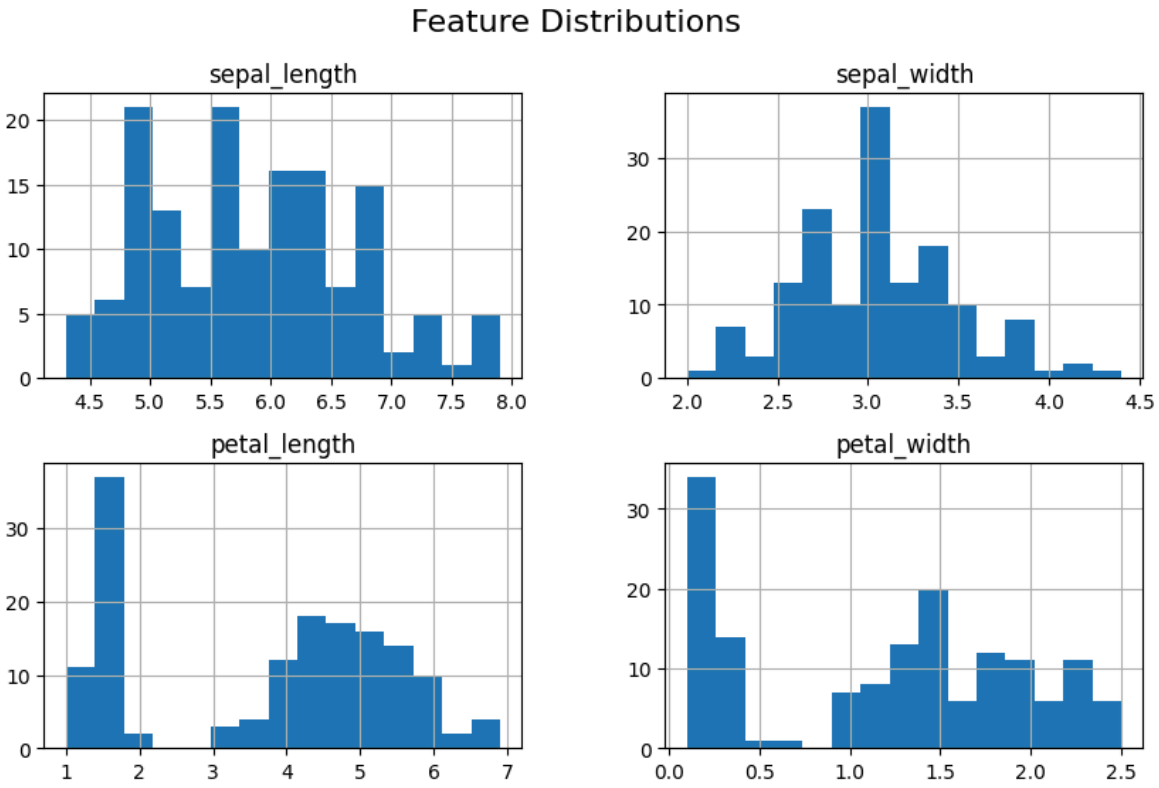
In [8]:
```
#Load the dataset:
```

In [9]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# Load iris dataset (seaborn has it built-in)
df = sns.load_dataset("iris")

print(df.head())
```

```
   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
```

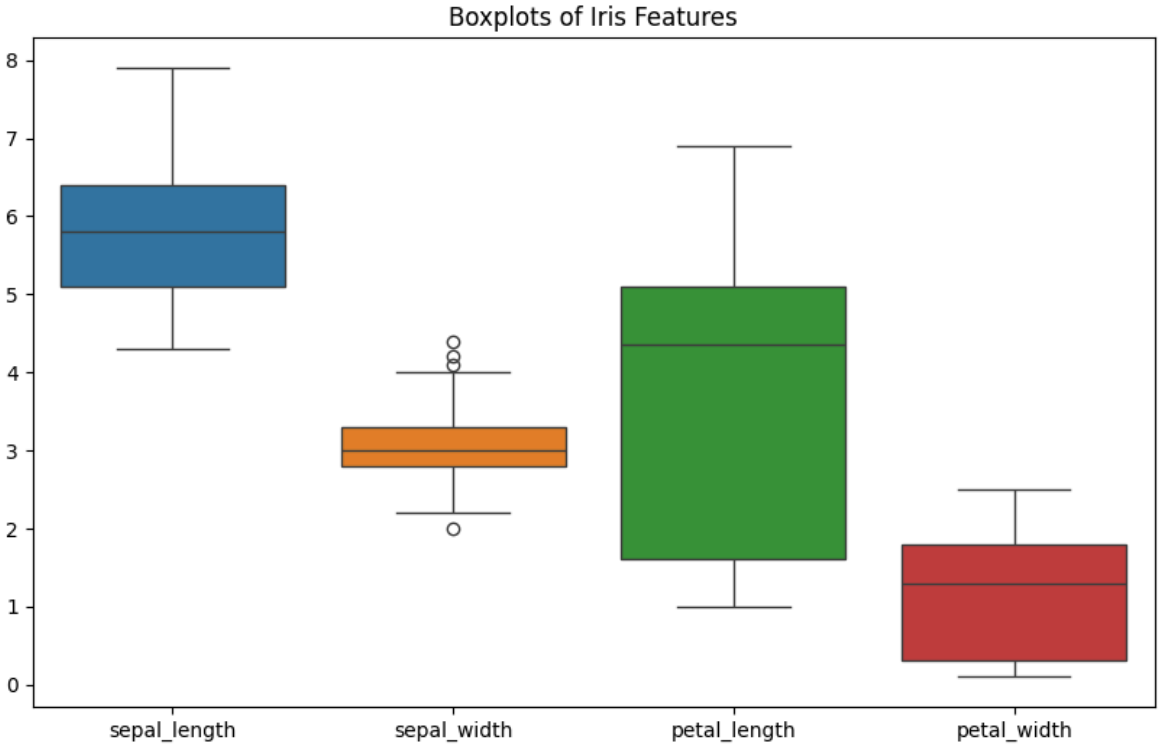
In [10]:
```
#plot using histogram:
```

In [11]:
```
df.hist(figsize=(10, 6), bins=15)
plt.suptitle("Feature Distributions", fontsize=16)
plt.show()
```



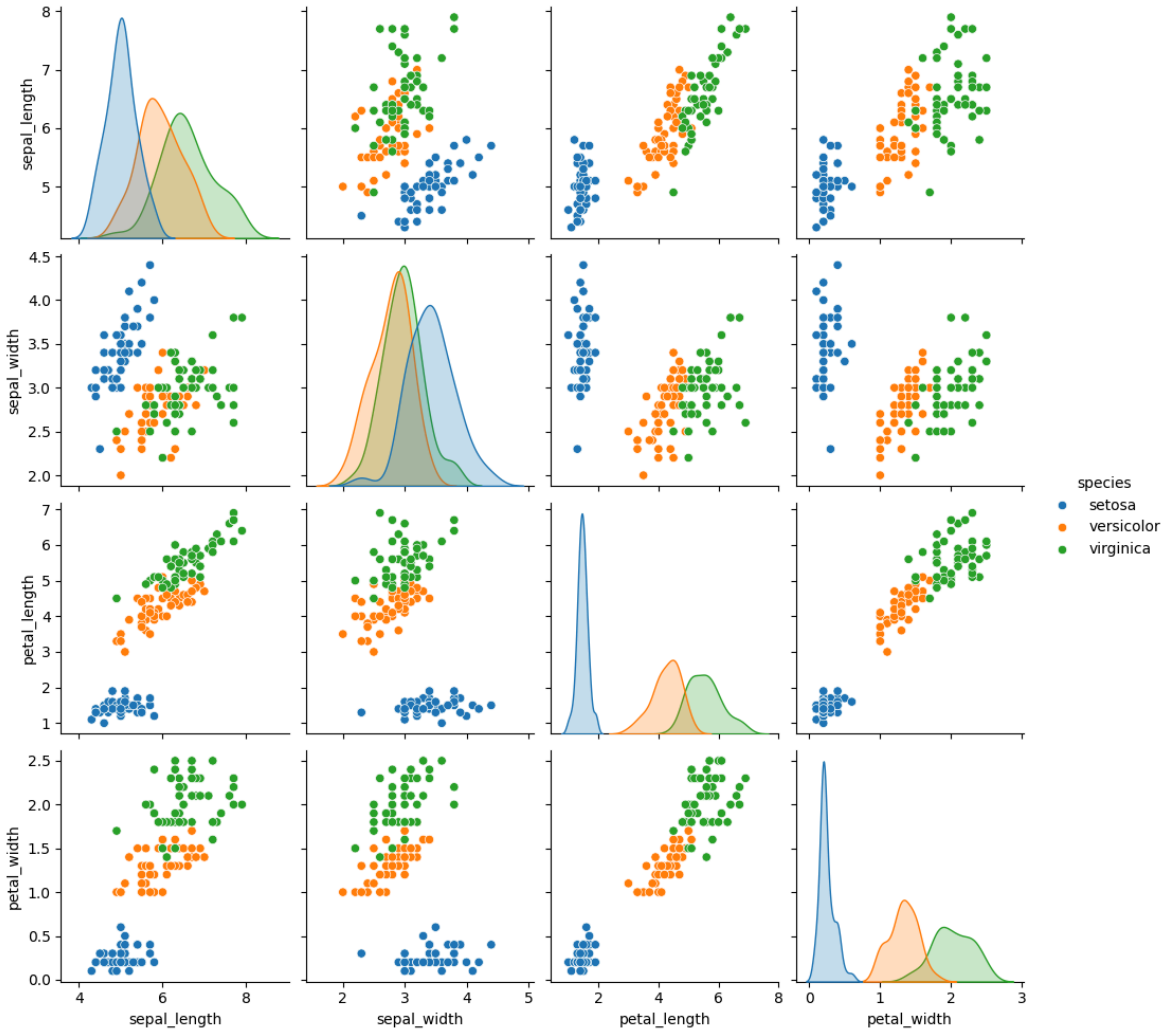
In [12]:
```
#Boxplots - Detect spread & outliers:
```

In [13]:
```
plt.figure(figsize=(10, 6))
sns.boxplot(data=df)
plt.title("Boxplots of Iris Features")
plt.show()
```



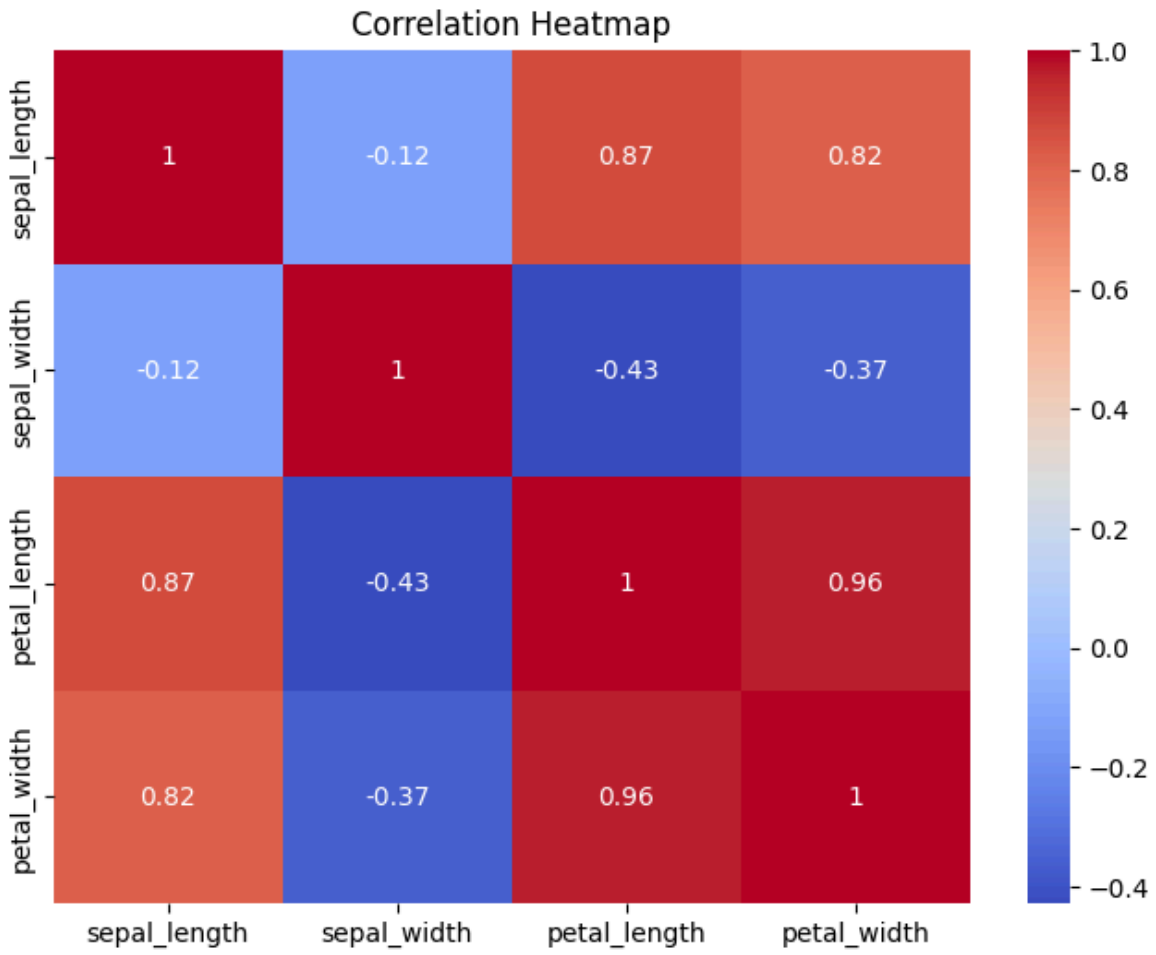
In [14]:
```
#Pairplot - Relationships between all features:
```

In [15]:
```
sns.pairplot(df, hue="species", diag_kind="kde")
plt.show()
```



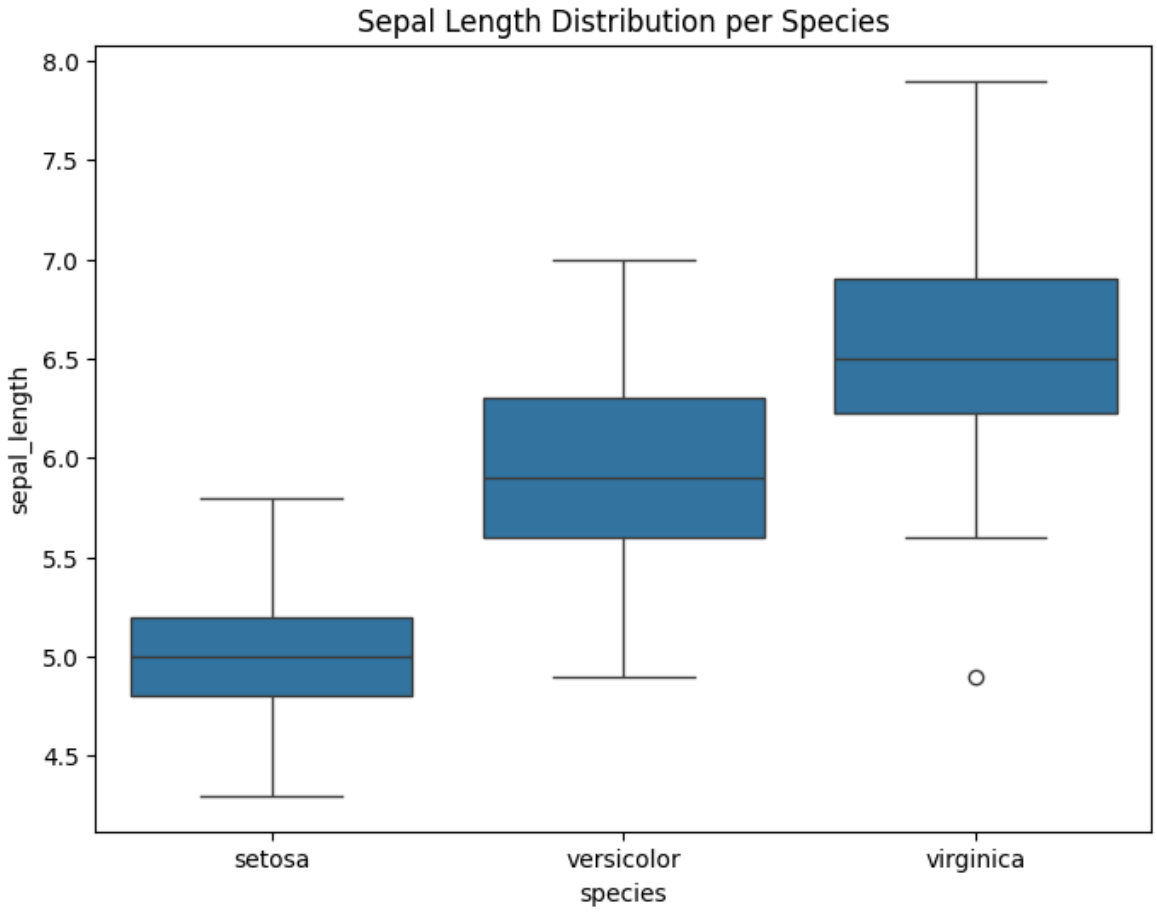
In [16]:
```
#Correlation Heatmap:
```

In [17]:
```
plt.figure(figsize=(8, 6))
sns.heatmap(df.drop("species", axis=1).corr(), annot=True, cmap="coolwarm")
plt.title("Correlation Heatmap")
plt.show()
```



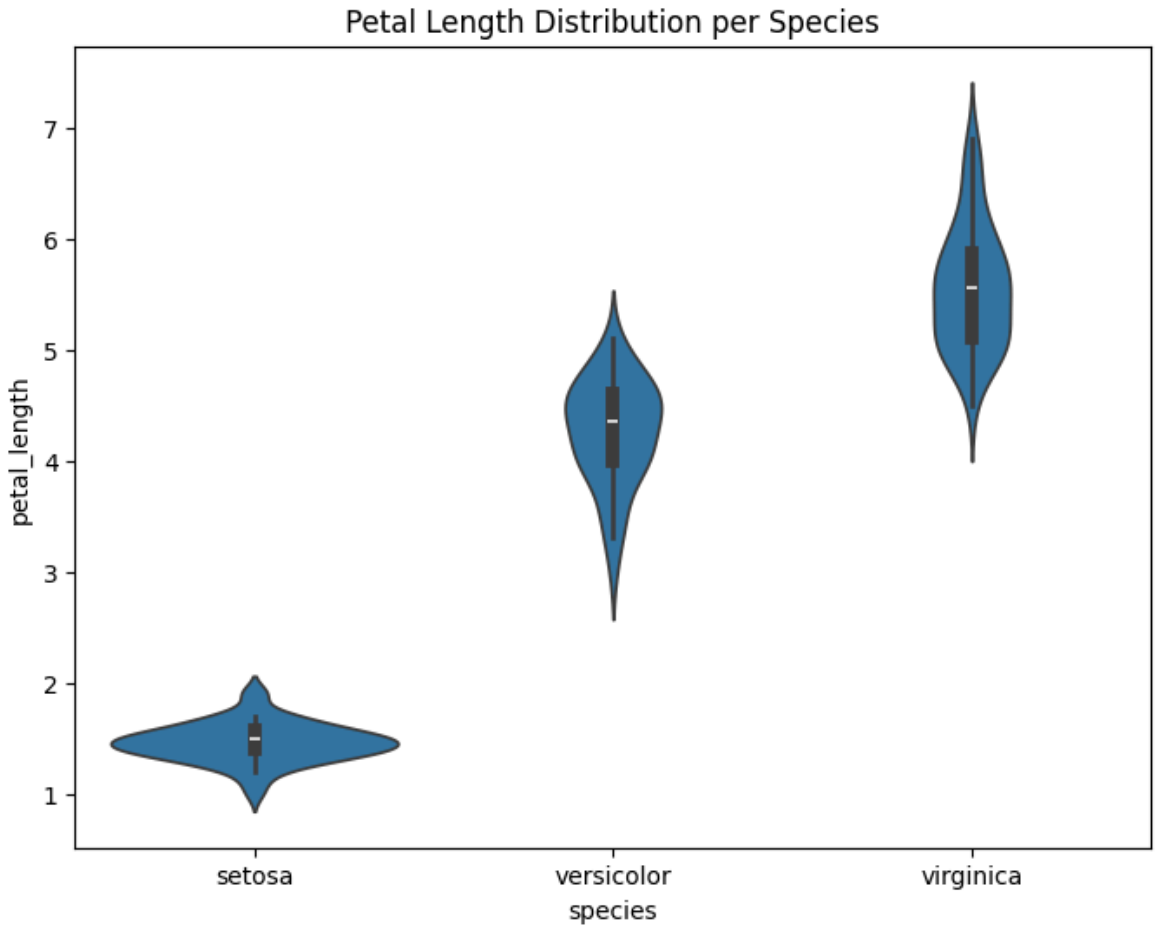
In [18]:
```
#Species-wise Boxplot (Feature Comparison):
```

In [19]:
```
plt.figure(figsize=(8, 6))
sns.boxplot(x="species", y="sepal_length", data=df)
plt.title("Sepal Length Distribution per Species")
plt.show()
```



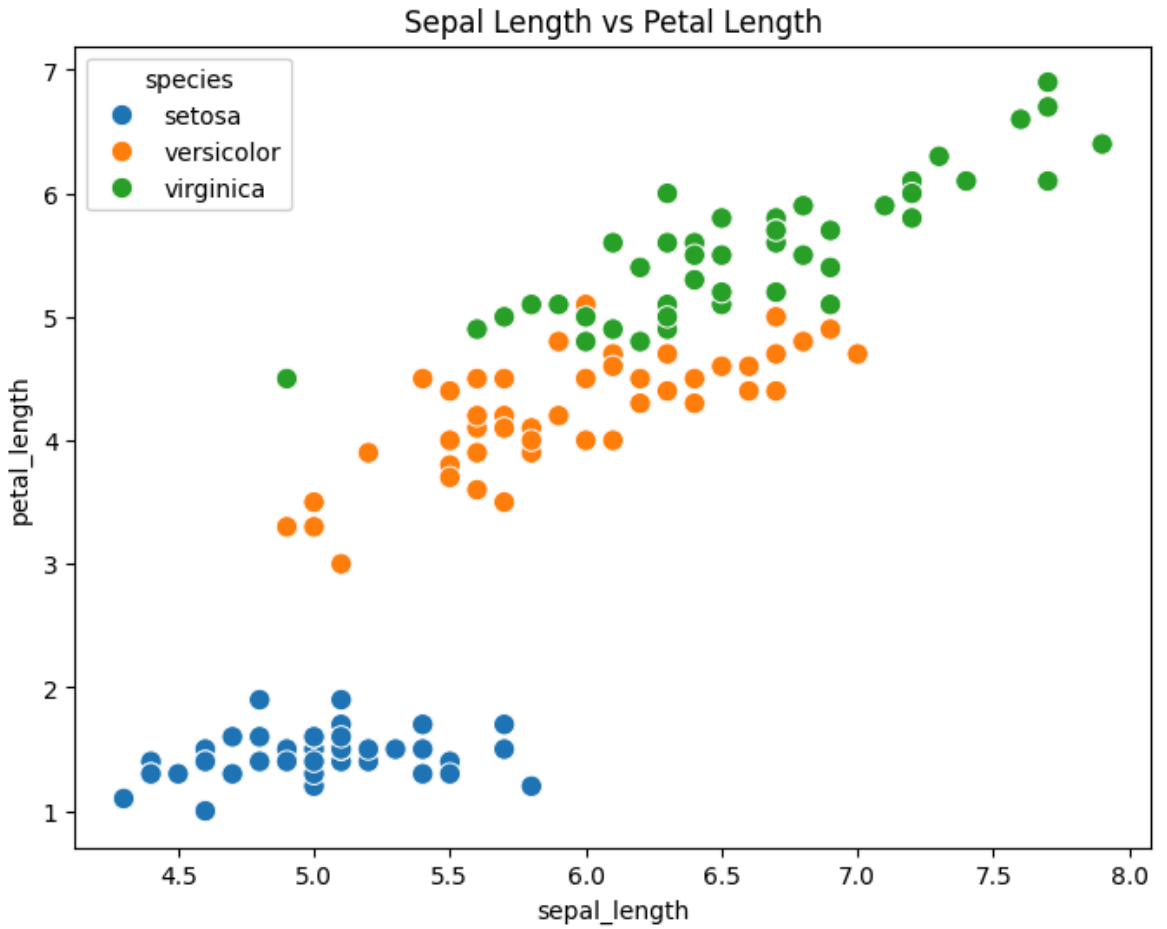
In [20]:
```
#Violin Plots – Feature Distribution by Species:
```

In [21]:
```
plt.figure(figsize=(8, 6))
sns.violinplot(x="species", y="petal_length", data=df)
plt.title("Petal Length Distribution per Species")
plt.show()
```



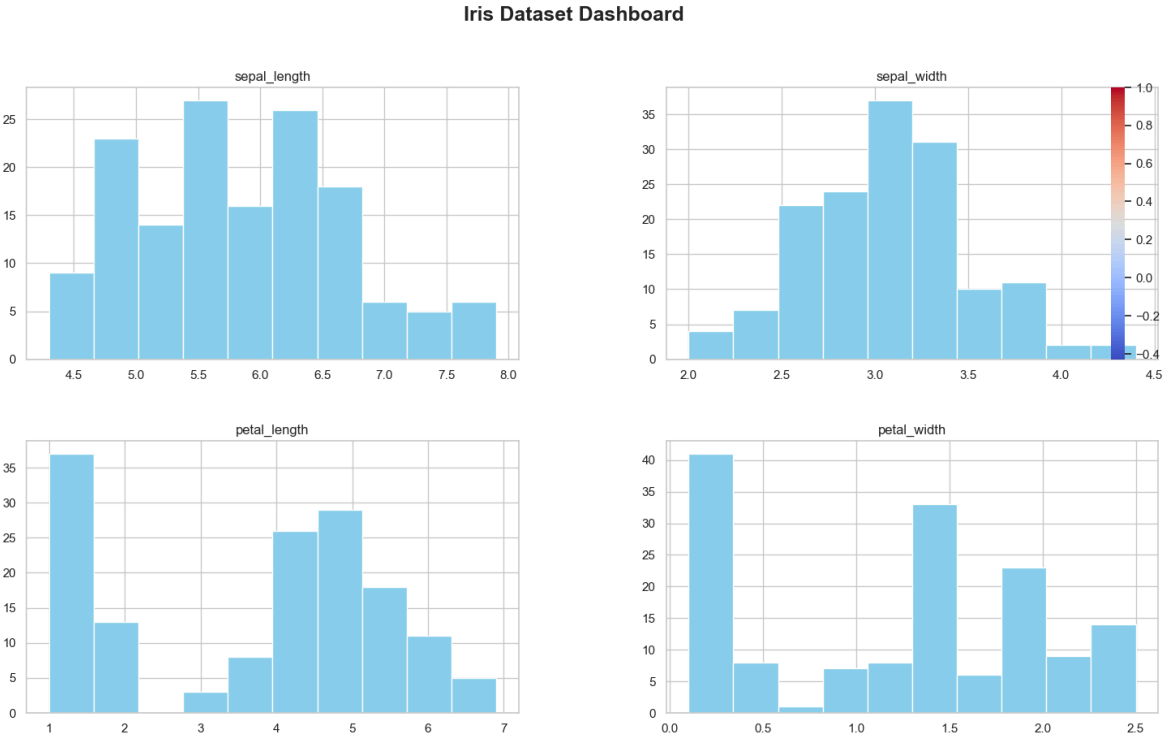
In [22]:
```
#Scatter Plot (2D Feature Space):
```

In [23]:
```
plt.figure(figsize=(8, 6))
sns.scatterplot(x="sepal_length", y="petal_length", hue="species", data=df, s=80
plt.title("Sepal Length vs Petal Length")
plt.show()
```



In [24]:
```python
# Dashboard-style visualization of Iris dataset
import seaborn as sns
import matplotlib.pyplot as plt
import pandas as pd

# Load dataset
df = sns.load_dataset("iris")

# Set style
sns.set(style="whitegrid")

# Create figure and subplots
fig, axes = plt.subplots(2, 3, figsize=(18, 10))

# 1. Histogram
df.drop("species", axis=1).hist(ax=axes[0,0], bins=10, color="skyblue")
axes[0,0].set_title("Feature Distributions")

# 2. Boxplot by feature
sns.boxplot(data=df.drop("species", axis=1), ax=axes[0,1])
axes[0,1].set_title("Boxplots of Features")

# 3. Heatmap
sns.heatmap(df.drop("species", axis=1).corr(), annot=True, cmap="coolwarm", ax=a
axes[0,2].set_title("Correlation Heatmap")

# 4. Scatterplot
sns.scatterplot(x="sepal_length", y="petal_length", hue="species", data=df, ax=a
axes[1,0].set_title("Sepal Length vs Petal Length")

# 5. Boxplot by species
```

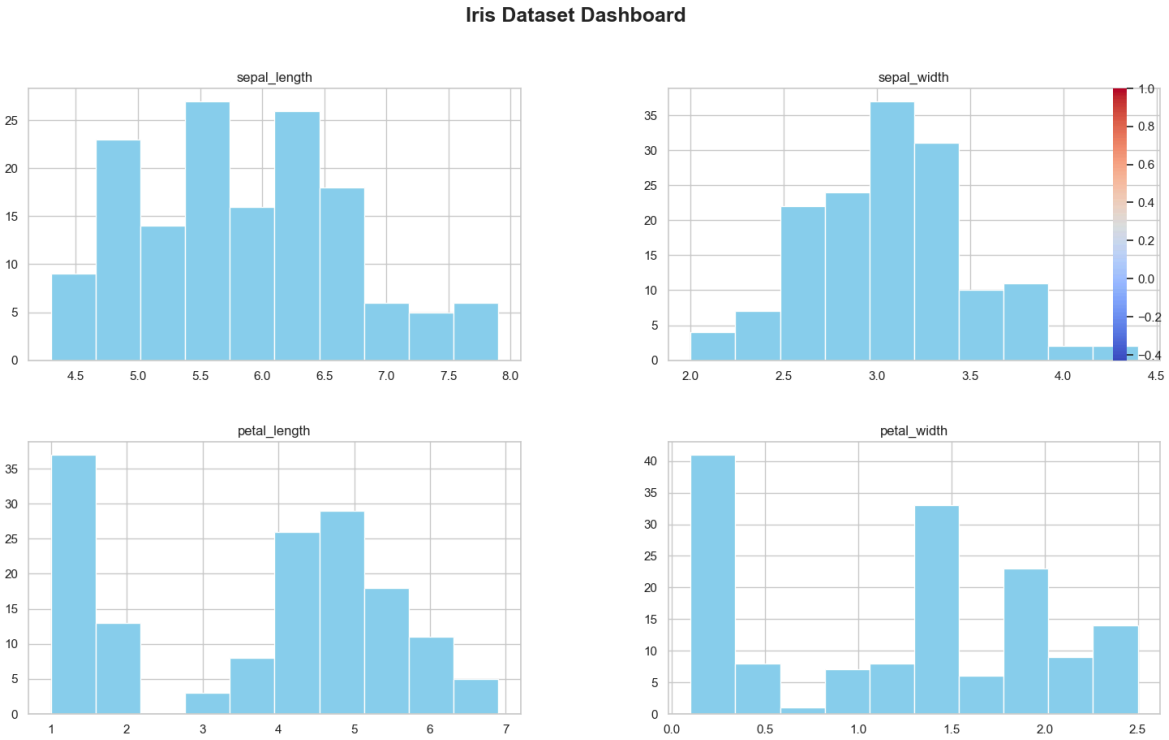
```
sns.boxplot(x="species", y="sepal_length", data=df, ax=axes[1,1])
axes[1,1].set_title("Sepal Length by Species")

# 6. Violin plot
sns.violinplot(x="species", y="petal_length", data=df, ax=axes[1,2])
axes[1,2].set_title("Petal Length by Species")

plt.suptitle("Iris Dataset Dashboard", fontsize=18, fontweight="bold")
plt.tight_layout(rect=[0, 0, 1, 0.96])  # Adjust layout
plt.show()
```

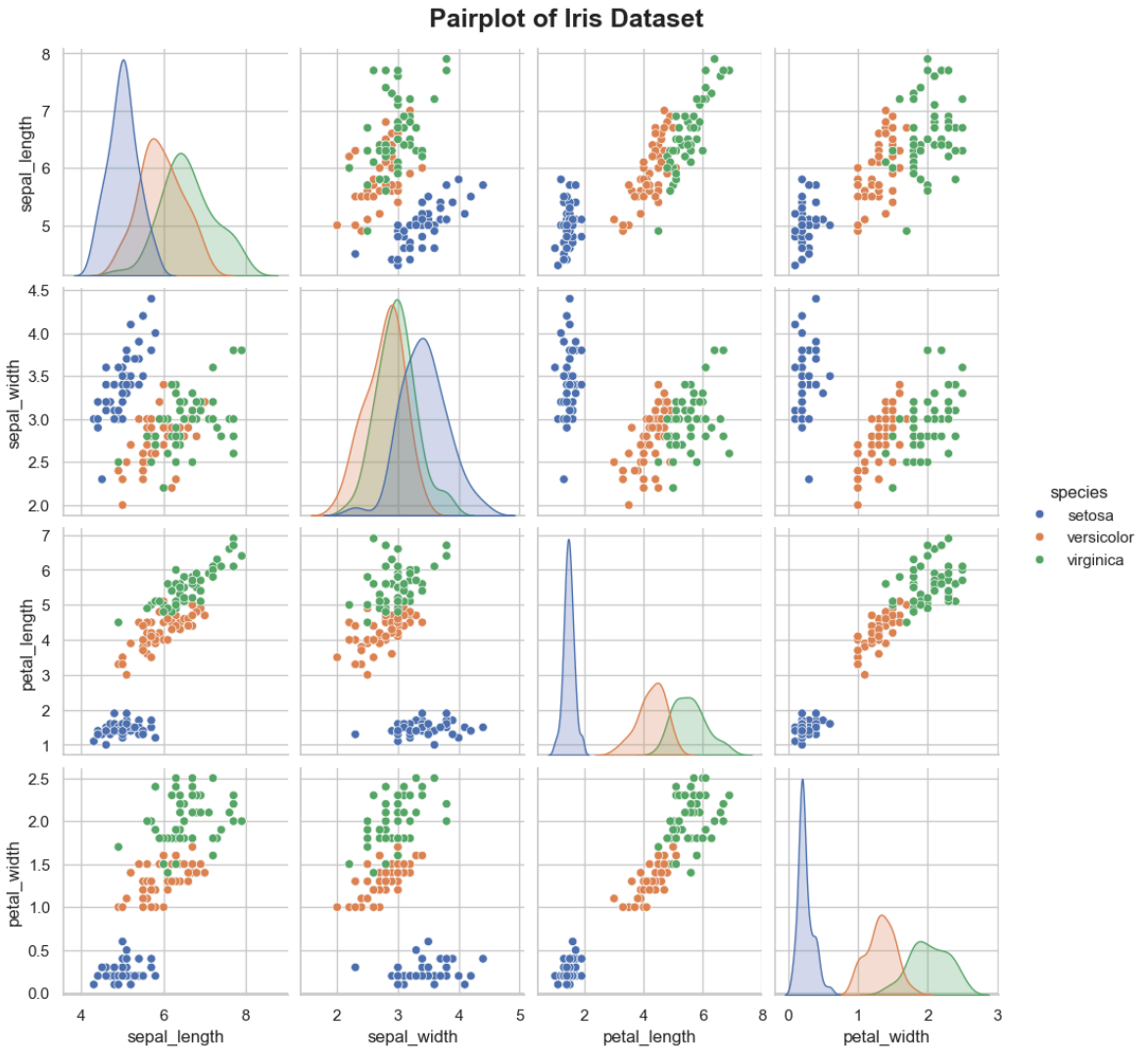


In [25]:

```
# Dashboard + Pairplot visualization of Iris dataset
import seaborn as sns
import matplotlib.pyplot as plt

# Load dataset
df = sns.load_dataset("iris")

# Set style
sns.set(style="whitegrid")

# ---------------- Dashboard ----------------
fig, axes = plt.subplots(2, 3, figsize=(18, 10))

# 1. Histogram
df.drop("species", axis=1).hist(ax=axes[0,0], bins=10, color="skyblue")
axes[0,0].set_title("Feature Distributions")

# 2. Boxplot by feature
sns.boxplot(data=df.drop("species", axis=1), ax=axes[0,1])
axes[0,1].set_title("Boxplots of Features")

# 3. Heatmap
sns.heatmap(df.drop("species", axis=1).corr(), annot=True, cmap="coolwarm", ax=a
axes[0,2].set_title("Correlation Heatmap")

# 4. Scatterplot
```

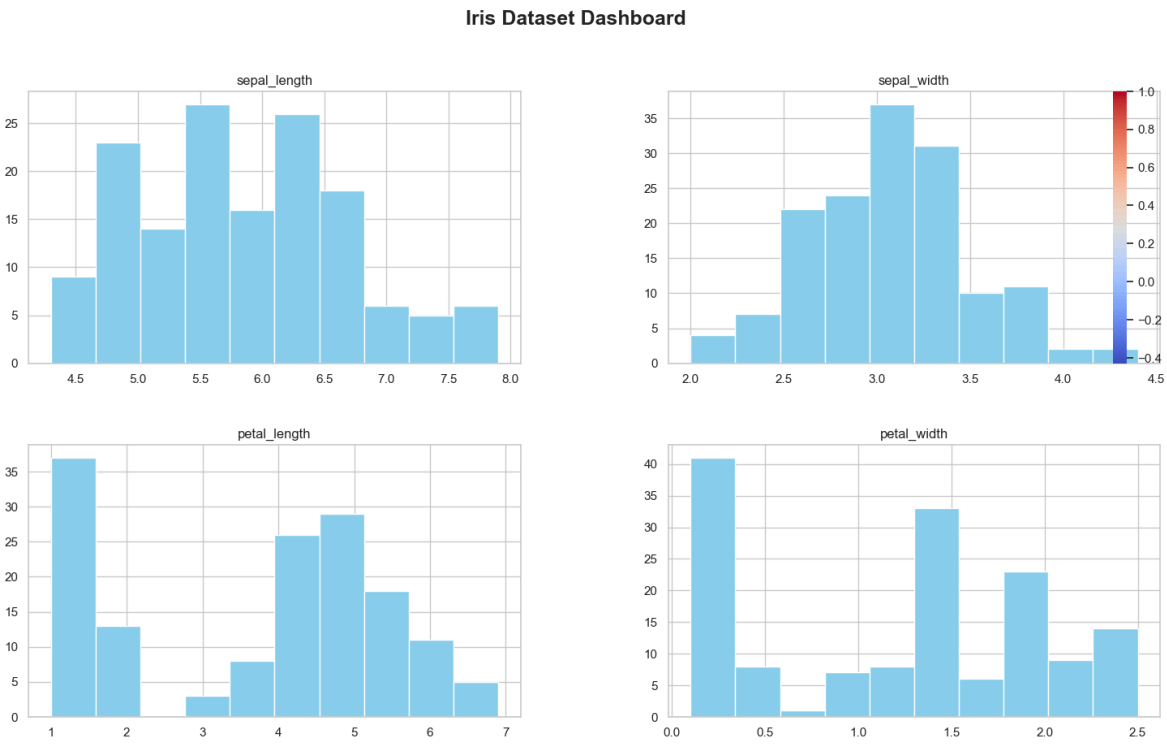
```
sns.scatterplot(x="sepal_length", y="petal_length", hue="species", data=df, ax=a
axes[1,0].set_title("Sepal Length vs Petal Length")

# 5. Boxplot by species
sns.boxplot(x="species", y="sepal_length", data=df, ax=axes[1,1])
axes[1,1].set_title("Sepal Length by Species")

# 6. Violin plot
sns.violinplot(x="species", y="petal_length", data=df, ax=axes[1,2])
axes[1,2].set_title("Petal Length by Species")

plt.suptitle("Iris Dataset Dashboard", fontsize=18, fontweight="bold")
plt.tight_layout(rect=[0, 0, 1, 0.96])
plt.show()

# ---------------- Pairplot ----------------
sns.pairplot(df, hue="species", diag_kind="kde")
plt.suptitle("Pairplot of Iris Dataset", fontsize=18, fontweight="bold", y=1.02)
plt.show()
```

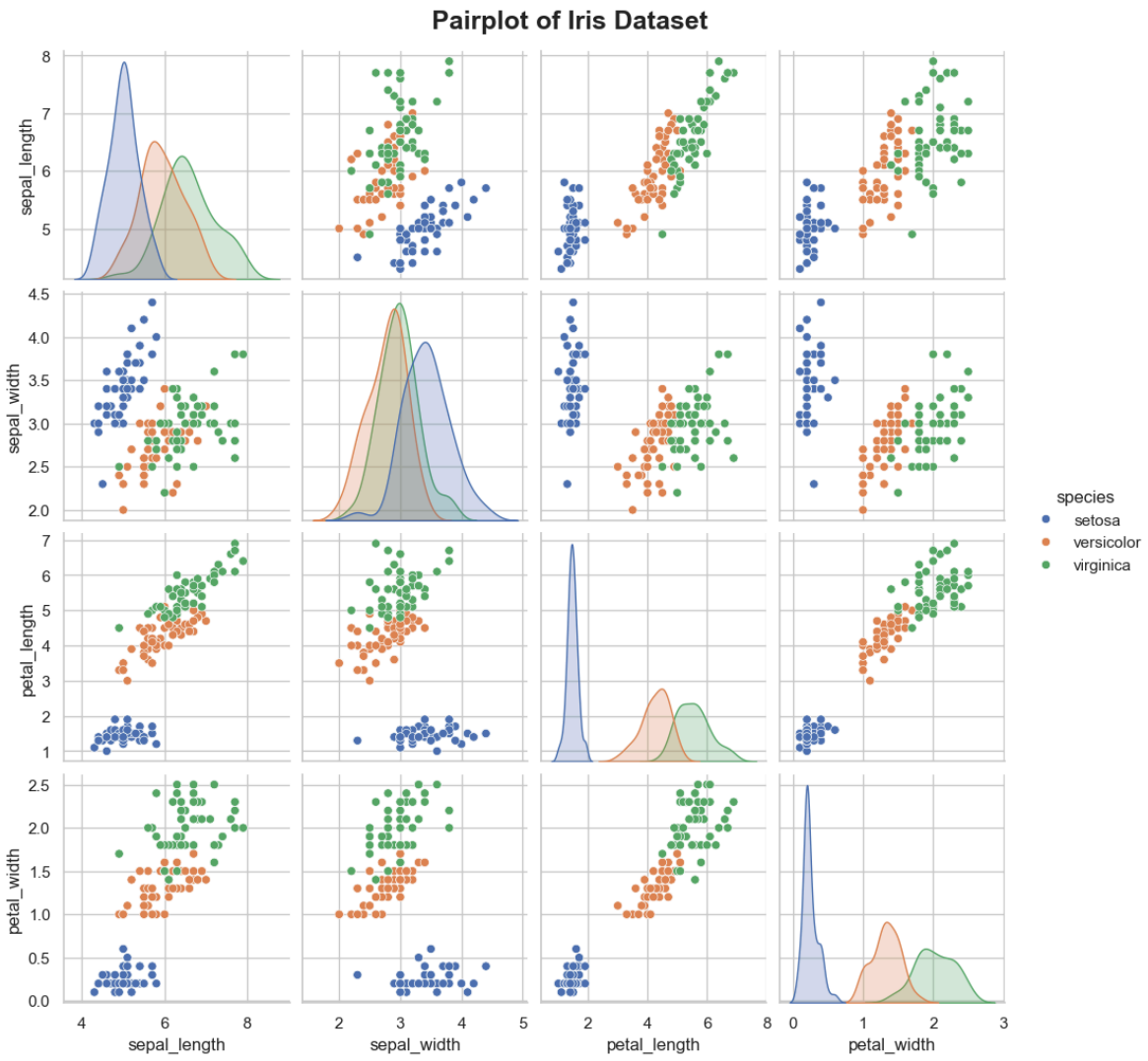


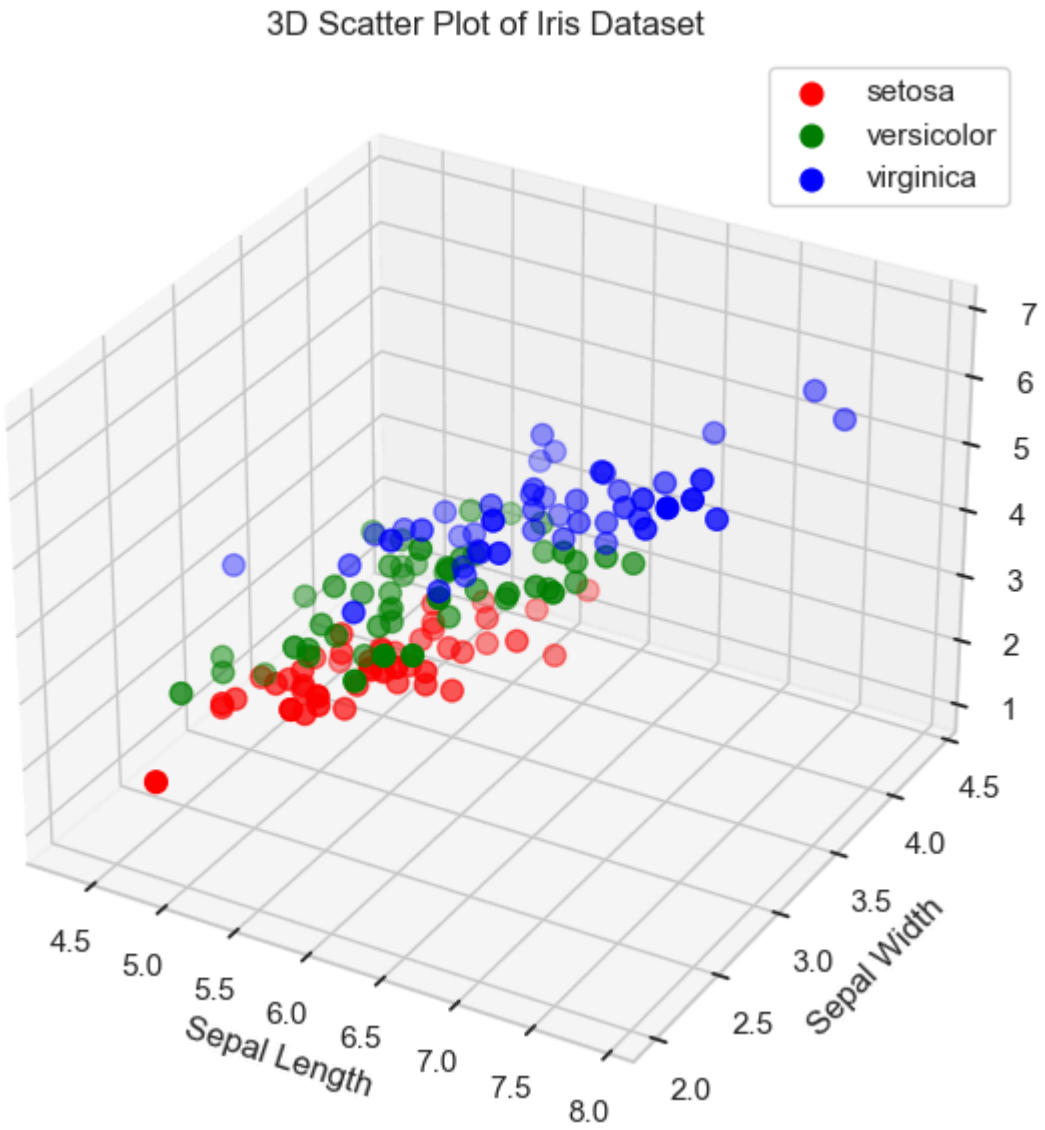


In [26]:
```
# Iris Dataset: Dashboard + Pairplot + 3D Scatter
import seaborn as sns
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D  # for 3D plots

# Load dataset
df = sns.load_dataset("iris")
sns.set(style="whitegrid")

# ---------------- Dashboard ----------------
fig, axes = plt.subplots(2, 3, figsize=(18, 10))

# 1. Histogram
df.drop("species", axis=1).hist(ax=axes[0,0], bins=10, color="skyblue")
axes[0,0].set_title("Feature Distributions")

# 2. Boxplot by feature
sns.boxplot(data=df.drop("species", axis=1), ax=axes[0,1])
axes[0,1].set_title("Boxplots of Features")

# 3. Heatmap
sns.heatmap(df.drop("species", axis=1).corr(), annot=True, cmap="coolwarm", ax=a
axes[0,2].set_title("Correlation Heatmap")

# 4. Scatterplot
sns.scatterplot(x="sepal_length", y="petal_length", hue="species", data=df, ax=a
axes[1,0].set_title("Sepal Length vs Petal Length")
```

```
# 5. Boxplot by species
sns.boxplot(x="species", y="sepal_length", data=df, ax=axes[1,1])
axes[1,1].set_title("Sepal Length by Species")

# 6. Violin plot
sns.violinplot(x="species", y="petal_length", data=df, ax=axes[1,2])
axes[1,2].set_title("Petal Length by Species")

plt.suptitle("Iris Dataset Dashboard", fontsize=18, fontweight="bold")
plt.tight_layout(rect=[0, 0, 1, 0.96])
plt.show()

# ---------------- Pairplot ----------------
sns.pairplot(df, hue="species", diag_kind="kde")
plt.suptitle("Pairplot of Iris Dataset", fontsize=18, fontweight="bold", y=1.02)
plt.show()

# ---------------- 3D Scatter Plot ----------------
fig = plt.figure(figsize=(10, 7))
ax = fig.add_subplot(111, projection="3d")

species_list = df["species"].unique()
colors = ["red", "green", "blue"]

for species, color in zip(species_list, colors):
    subset = df[df["species"] == species]
    ax.scatter(
        subset["sepal_length"],
        subset["sepal_width"],
        subset["petal_length"],
        c=color, label=species, s=60
    )

ax.set_xlabel("Sepal Length")
ax.set_ylabel("Sepal Width")
ax.set_zlabel("Petal Length")
ax.set_title("3D Scatter Plot of Iris Dataset")
ax.legend()
plt.show()
```


Iris Dataset Dashboard
sepal_length
sepal_width
petal_length
petal_width

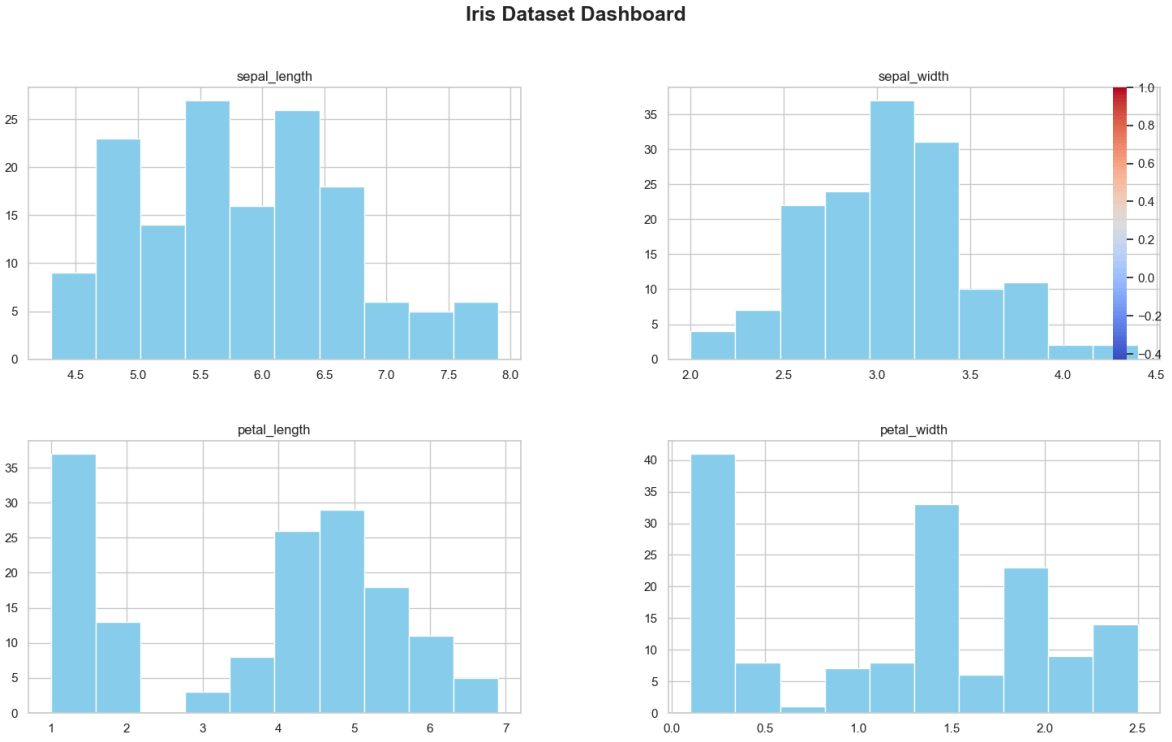

Pairplot of Iris Dataset
sepal_length
sepal_width
petal_length
petal_width
species
setosa
versicolor
virginica

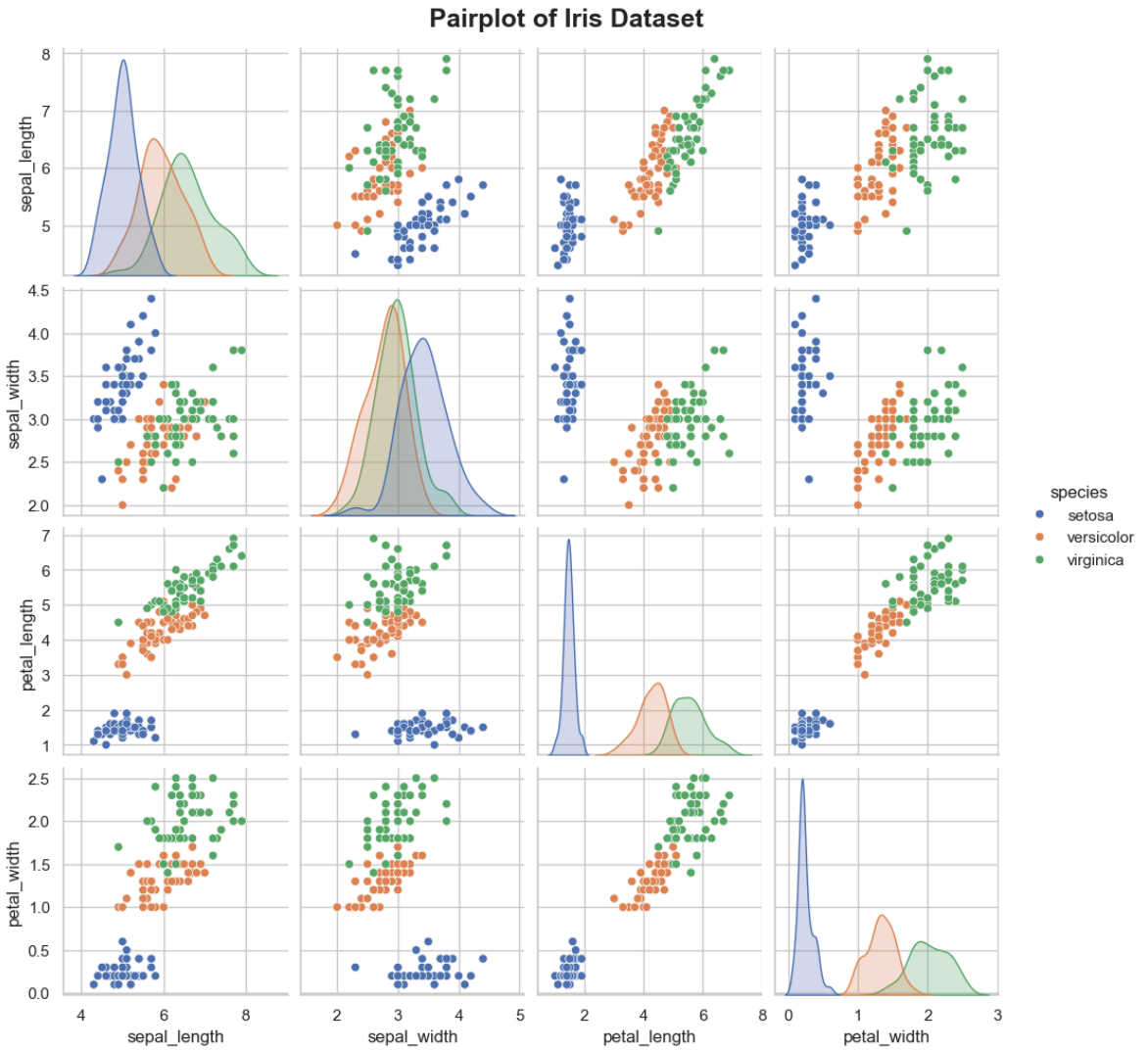


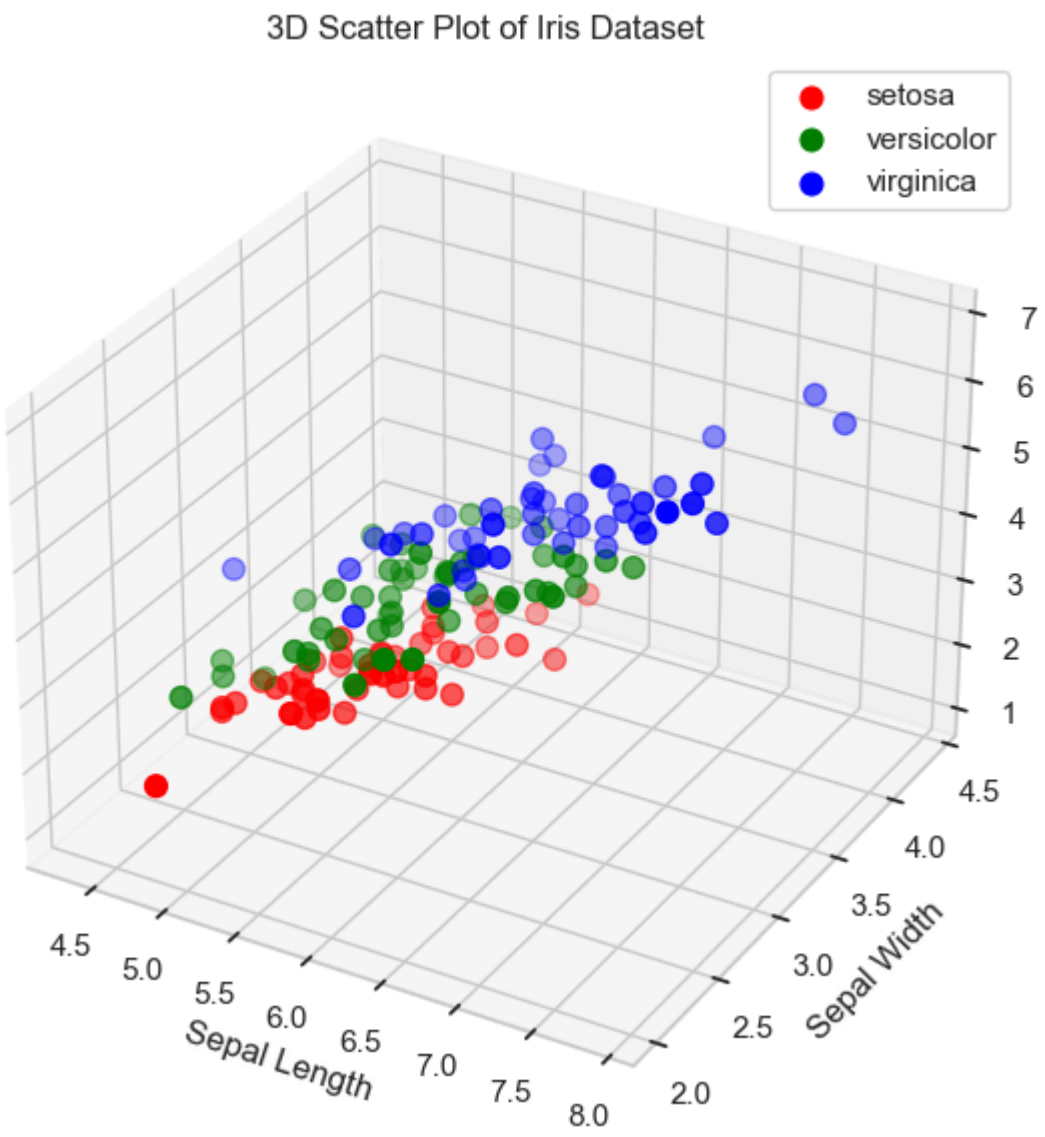
In [27]:
```python
# Iris Dataset: Dashboard + Pairplot + 3D + 4D Scatter
import seaborn as sns
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D

# Load dataset
df = sns.load_dataset("iris")
sns.set(style="whitegrid")

# ---------------- Dashboard ----------------
fig, axes = plt.subplots(2, 3, figsize=(18, 10))

# 1. Histogram
df.drop("species", axis=1).hist(ax=axes[0,0], bins=10, color="skyblue")
axes[0,0].set_title("Feature Distributions")

# 2. Boxplot by feature
sns.boxplot(data=df.drop("species", axis=1), ax=axes[0,1])
axes[0,1].set_title("Boxplots of Features")

# 3. Heatmap
sns.heatmap(df.drop("species", axis=1).corr(), annot=True, cmap="coolwarm", ax=a
axes[0,2].set_title("Correlation Heatmap")

# 4. Scatterplot
```

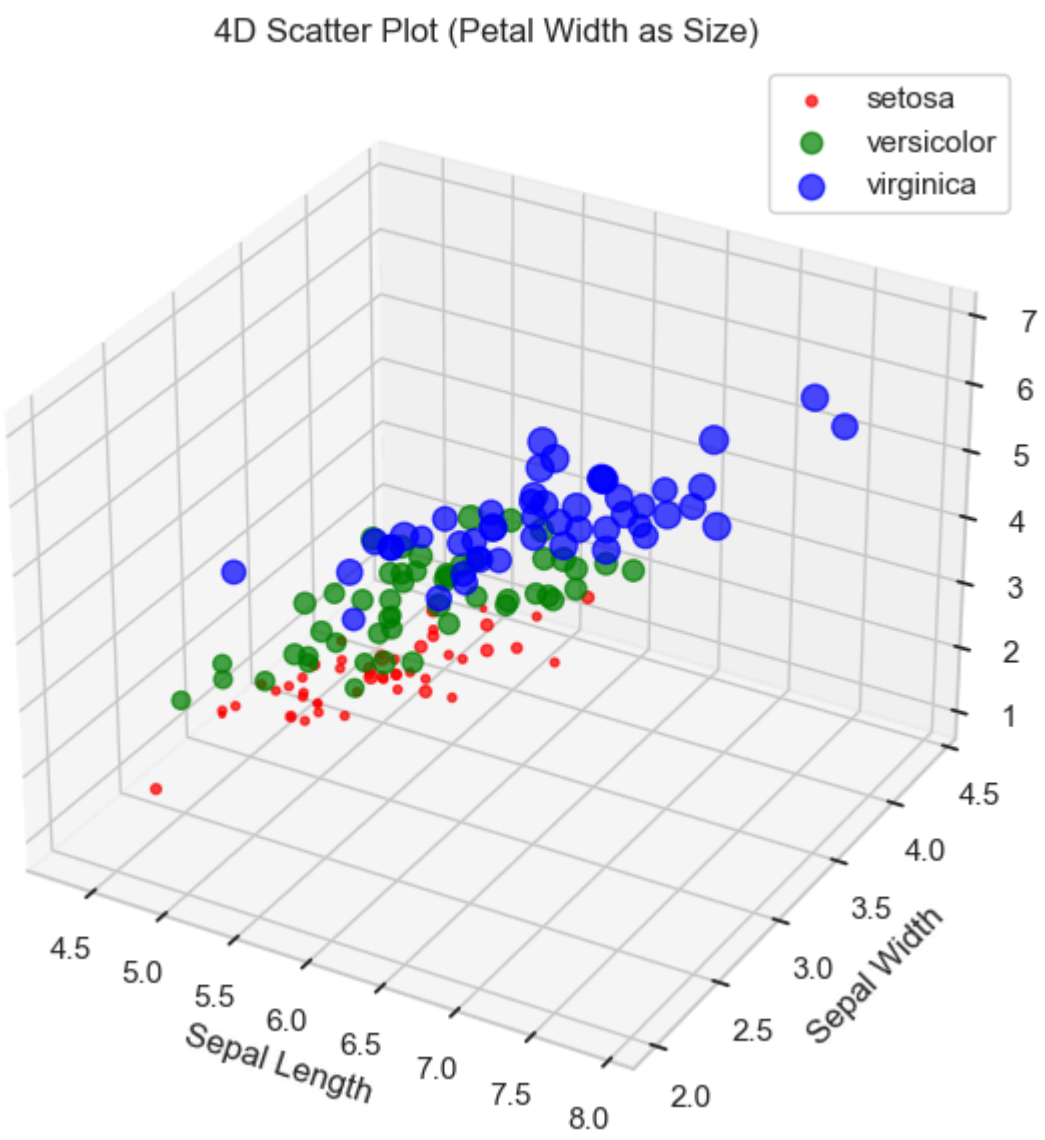
```
sns.scatterplot(x="sepal_length", y="petal_length", hue="species", data=df, ax=a
axes[1,0].set_title("Sepal Length vs Petal Length")

# 5. Boxplot by species
sns.boxplot(x="species", y="sepal_length", data=df, ax=axes[1,1])
axes[1,1].set_title("Sepal Length by Species")

# 6. Violin plot
sns.violinplot(x="species", y="petal_length", data=df, ax=axes[1,2])
axes[1,2].set_title("Petal Length by Species")

plt.suptitle("Iris Dataset Dashboard", fontsize=18, fontweight="bold")
plt.tight_layout(rect=[0, 0, 1, 0.96])
plt.show()

# ---------------- Pairplot ----------------
sns.pairplot(df, hue="species", diag_kind="kde")
plt.suptitle("Pairplot of Iris Dataset", fontsize=18, fontweight="bold", y=1.02)
plt.show()

# ---------------- 3D Scatter Plot ----------------
fig = plt.figure(figsize=(10, 7))
ax = fig.add_subplot(111, projection="3d")

species_list = df["species"].unique()
colors = ["red", "green", "blue"]

for species, color in zip(species_list, colors):
    subset = df[df["species"] == species]
    ax.scatter(
        subset["sepal_length"],
        subset["sepal_width"],
        subset["petal_length"],
        c=color, label=species, s=60
    )

ax.set_xlabel("Sepal Length")
ax.set_ylabel("Sepal Width")
ax.set_zlabel("Petal Length")
ax.set_title("3D Scatter Plot of Iris Dataset")
ax.legend()
plt.show()

# ---------------- 4D Scatter Plot ----------------
fig = plt.figure(figsize=(10, 7))
ax = fig.add_subplot(111, projection="3d")

for species, color in zip(species_list, colors):
    subset = df[df["species"] == species]
    ax.scatter(
        subset["sepal_length"],
        subset["sepal_width"],
        subset["petal_length"],
        c=color, s=subset["petal_width"] * 40,  # size = petal_width
        alpha=0.7, label=species
    )

ax.set_xlabel("Sepal Length")
ax.set_ylabel("Sepal Width")
ax.set_zlabel("Petal Length")
```

```
ax.set_title("4D Scatter Plot (Petal Width as Size)")
ax.legend()
plt.show()
```






3D Scatter Plot of Iris Dataset
setosa
versicolor
virginica
Sepal Length
Sepal Width
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
2.0
2.5
3.0
3.5
4.0
4.5
1
2
3
4
5
6
7


4D Scatter Plot (Petal Width as Size)
setosa
versicolor
virginica
Sepal Length
Sepal Width
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
2.0
2.5
3.0
3.5
4.0
4.5
1
2
3
4
5
6
7