Name:Asmit Sahu Roll: 23052231 working with iris dataset

In [2]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.datasets import load_iris
```

In [10]:
```
iris = load_iris()
X = iris.data
y = iris.target

print("Feature names:", iris.feature_names)
print("Target names:", iris.target_names)
print("\nFirst 100 samples:\n")

'''for i in range(100):
    print(f"Sample {i+1}: {X[i]} (class: {y[i]}, species: {iris.target_names[y[i]]}
```

```
df = pd.DataFrame(X, columns=iris.feature_names)
df.head()
```

```
Feature names: ['sepal length (cm)', 'sepal width (cm)', 'petal length (cm)', 'petal
width (cm)']
Target names: ['setosa' 'versicolor' 'virginica']

First 100 samples:
```

Out[10]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2

In [11]:
```
df = pd.DataFrame(iris.data, columns=iris.feature_names)
df["species"] = iris.target_names[iris.target]

print("\nDataFrame Head:")
#print(df.head())
df.head()
```

```
DataFrame Head:
```

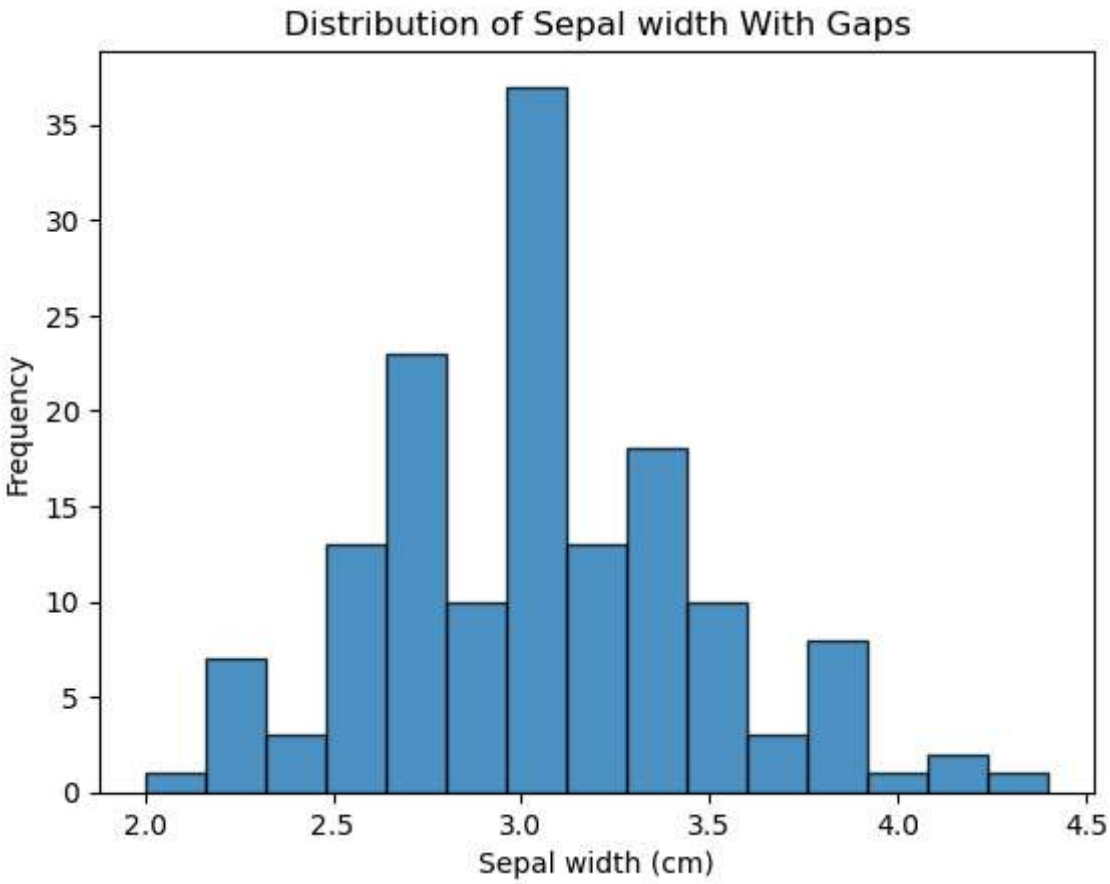
Out[11]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	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 [39]:

```
plt.hist(
    df["sepal width (cm)"],
    bins=15,                # more bins = more visible gaps
    edgecolor='black',      # outlines each bar -> creates gap effect
    linewidth=1,
    alpha=0.8
)

plt.xlabel("Sepal width (cm)")
plt.ylabel("Frequency")
plt.title("Distribution of Sepal width With Gaps")
plt.show()
```

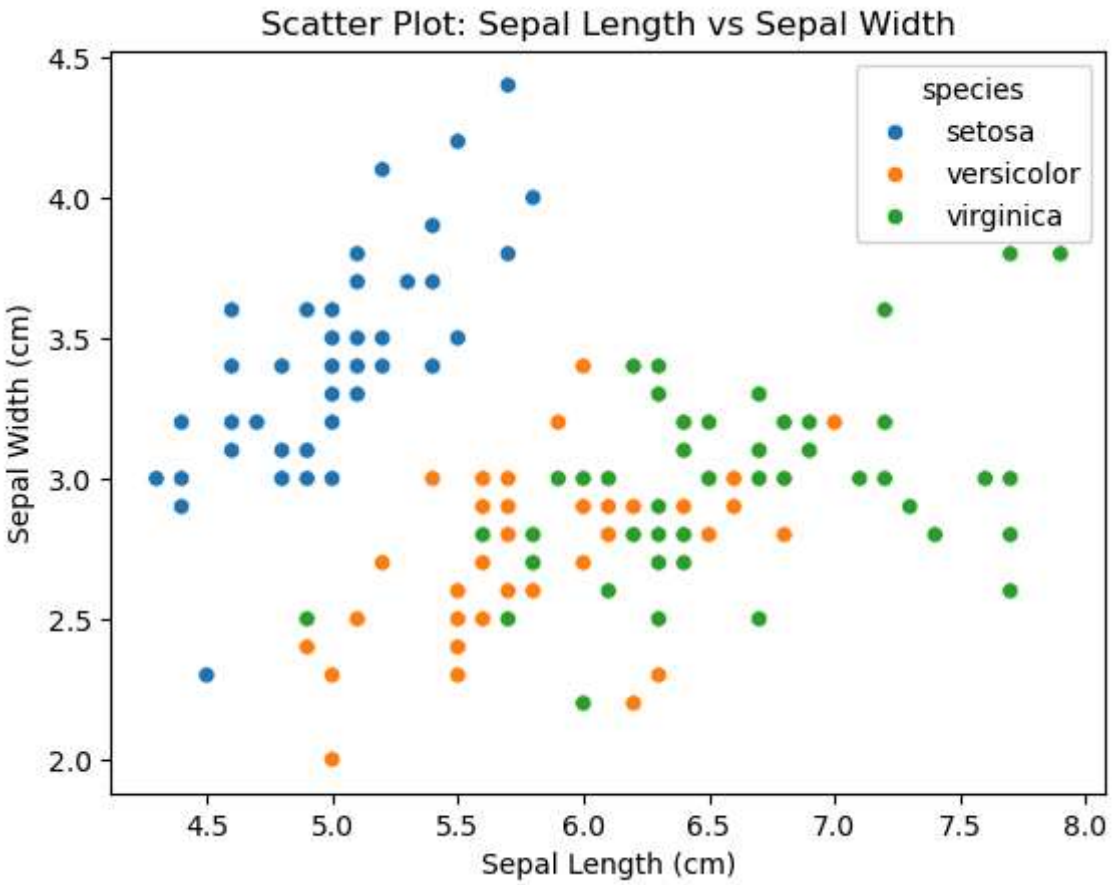


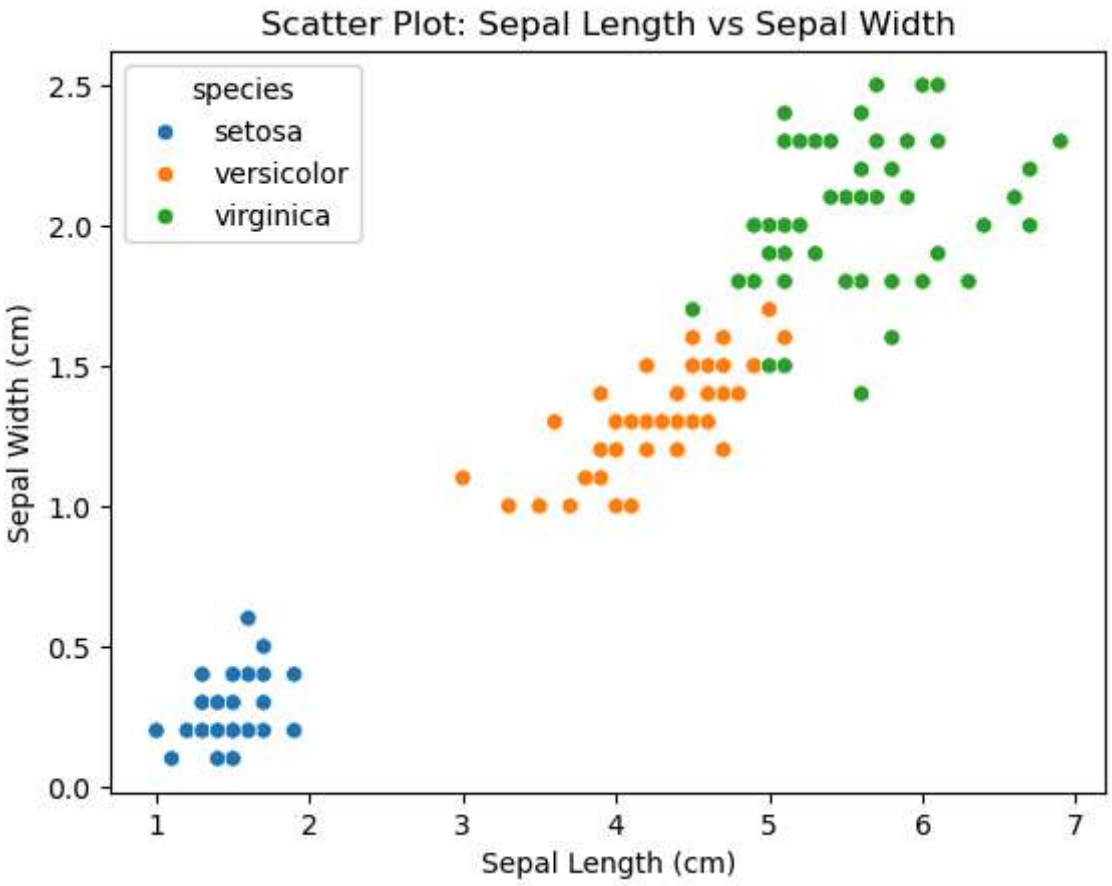
In [40]:

```
sns.scatterplot(
    x=df["sepal length (cm)"],
    y=df["sepal width (cm)"],
```

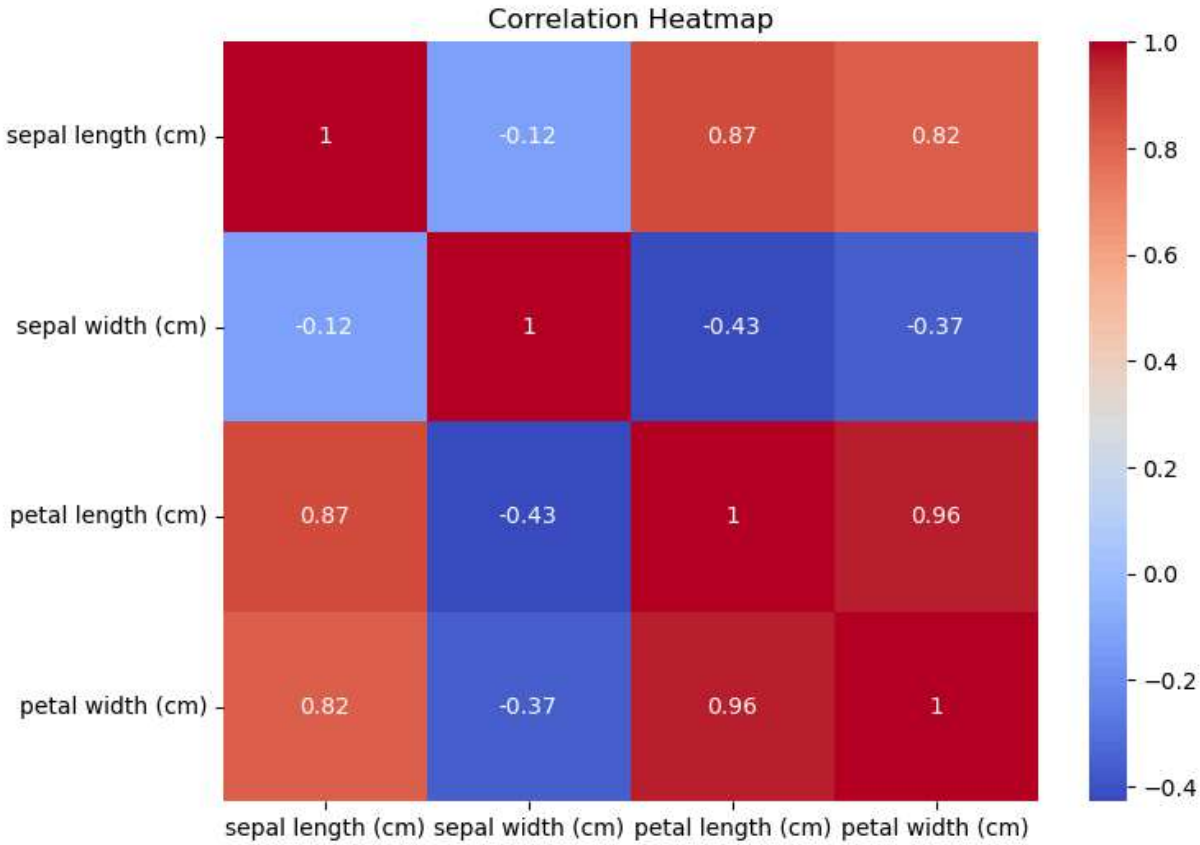
```
    hue=df["species"]
)
plt.xlabel("Sepal Length (cm)")
plt.ylabel("Sepal Width (cm)")
plt.title("Scatter Plot: Sepal Length vs Sepal Width")
plt.show()

sns.scatterplot(
    x=df["petal length (cm)"],
    y=df["petal width (cm)"],
    hue=df["species"]
)
plt.xlabel("Sepal Length (cm)")
plt.ylabel("Sepal Width (cm)")
plt.title("Scatter Plot: Sepal Length vs Sepal Width")
plt.show()
```





In [42]:
```
plt.figure(figsize=(8,6))
sns.heatmap(df.iloc[:, :4].corr(), annot=True, cmap="coolwarm")
plt.title("Correlation Heatmap")
plt.show()
```


Correlation Heatmap
sepal length (cm)
sepal width (cm)
petal length (cm)
petal width (cm)
1
-0.12
0.87
0.82
-0.12
1
-0.43
-0.37
0.87
-0.43
1
0.96
0.82
-0.37
0.96
1
sepal length (cm)
sepal width (cm)
petal length (cm)
petal width (cm)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4