

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

```
# 1. Import the iris dataset
df = pd.read_csv('Iris.csv')
print("Dataset loaded successfully!")
print(f"Dataset shape: {df.shape}")
print(df.head())
```

Dataset loaded successfully!

Dataset shape: (150, 6)

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

```
# 2. Separate the numeric columns in a dataframe
numeric_cols = ['SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm',
                'PetalWidthCm']
df_numeric = df[numeric_cols]
```

```
# 3. Create a correlation matrix
correlation_matrix = df_numeric.corr()
print("Correlation Matrix:")
print(correlation_matrix)
```

Correlation Matrix:

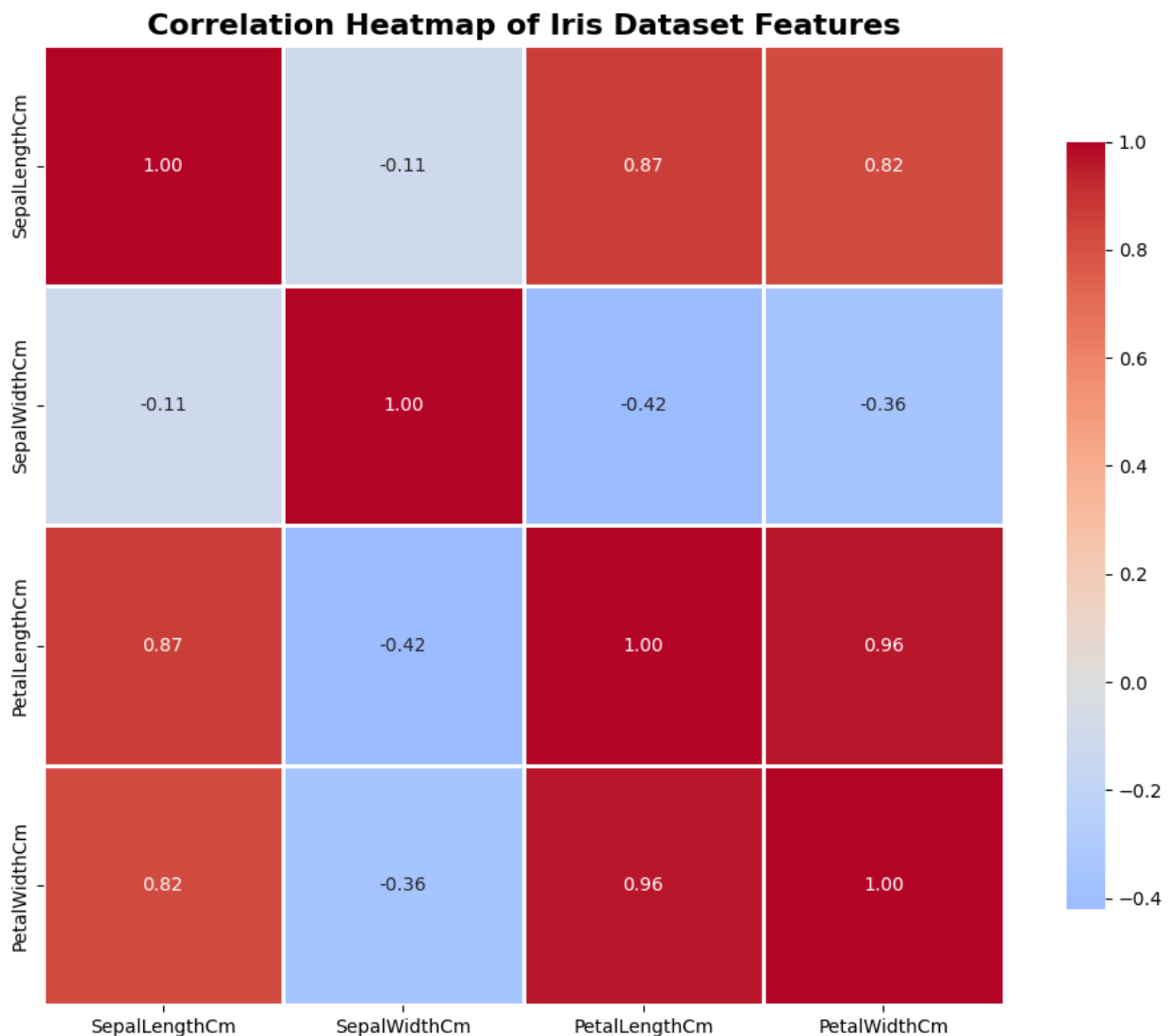
	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
PetalWidthCm				
SepalLengthCm	1.000000	-0.109369	0.871754	0.817954
SepalWidthCm	-0.109369	1.000000	-0.420516	-0.356544
PetalLengthCm	0.871754	-0.420516	1.000000	0.962757
PetalWidthCm	0.817954	-0.356544	0.962757	1.000000

```
# 4. Plot a heatmap
plt.figure(figsize=(10, 8))
sns.heatmap(correlation_matrix,
```

```

    annot=True, # Show correlation values
    cmap='coolwarm', # Color scheme
    center=0, # Center colormap at 0
    square=True, # Make cells square-shaped
    linewidths=1, # Add gridlines
    cbar_kws={"shrink": 0.8}, # Adjust colorbar size
    fmt='.2f') # Format numbers to 2 decimal places
plt.title('Correlation Heatmap of Iris Dataset Features', fontsize=16,
fontweight='bold')
plt.tight_layout()
plt.show()

```



```

# 5. Write inference
print("INFERENCE:")
print("""

```

Looking at the correlation heatmap, we can see some interesting patterns:

- Petal length and petal width are very strongly related (0.96). When one increases, the other almost always increases too. They're basically telling us the same story.
- Sepal length also correlates well with petal measurements (0.87 and 0.82), suggesting that larger flowers generally have bigger petals.
- Sepal width is the odd one out - it actually has negative correlations with petal features. This makes it unique and potentially useful for identifying different iris species.

In simple terms: petal measurements move together, while sepal width behaves independently. This means sepal width captures different information about the flowers compared to the other features.  
""")

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