In [2]:
```
# Kindly use the Jupyter Notebook to run this program.

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

# Load the built-in Iris dataset from seaborn
data = sns.load_dataset('iris')
print("✅ Iris dataset loaded successfully.")
data.head()
```

```
✅ Iris dataset loaded successfully.
```

Out [2]:

	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 [4]:
```
# Calculate Pearson correlation coefficient between sepal_length and petal_length
correlation = data[['sepal_length', 'petal_length']].corr(method='pearson')
print("📈 Pearson Correlation Coefficient:\n")
print(correlation)
```

```
📈 Pearson Correlation Coefficient:

              sepal_length  petal_length
sepal_length      1.000000      0.871754
petal_length      0.871754      1.000000
```

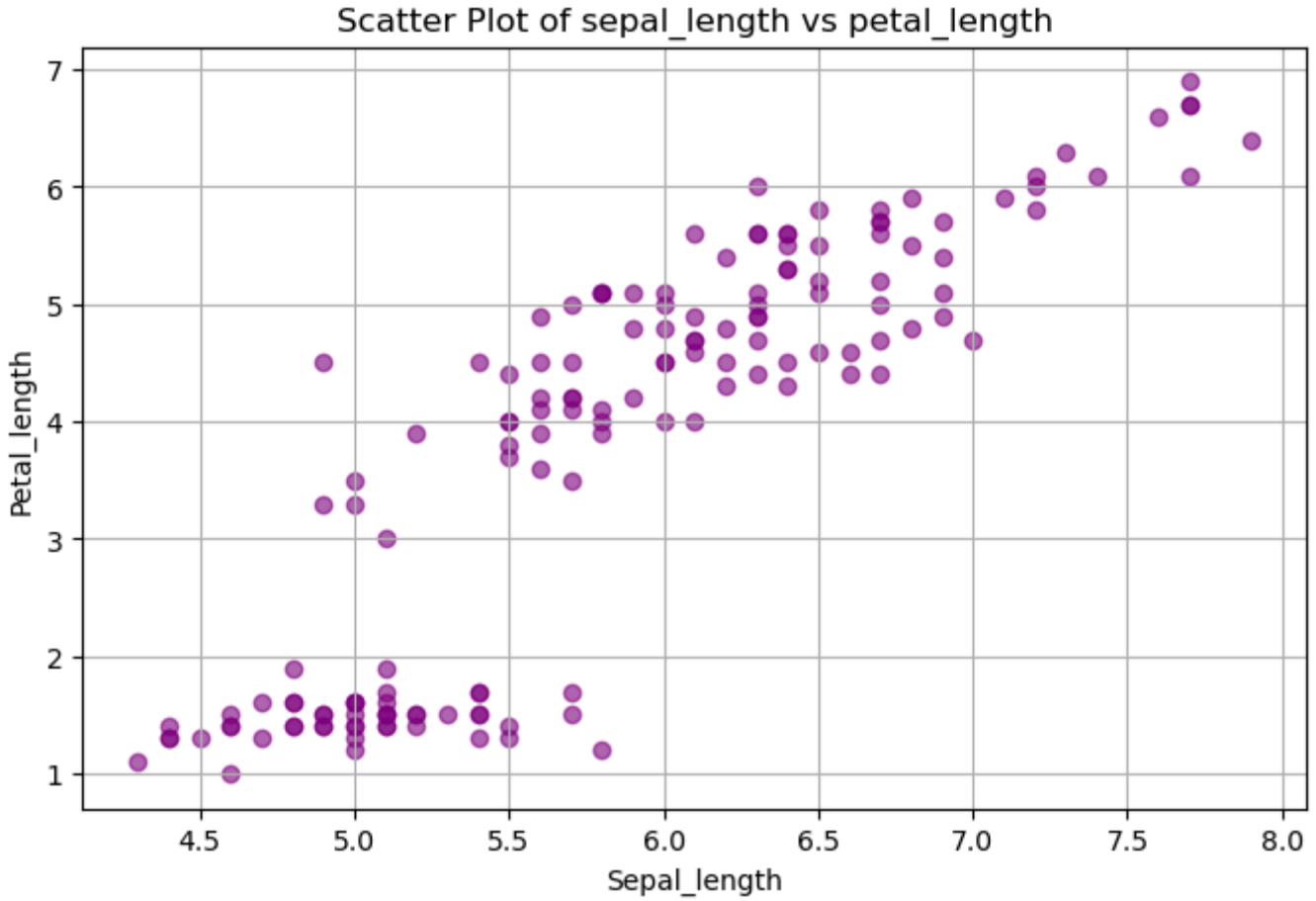
In [6]:
```
# Compute the covariance matrix
covariance = data[['sepal_length', 'petal_length']].cov()
print("📉 Covariance Matrix:\n")
print(covariance)
```

```
📉 Covariance Matrix:

              sepal_length  petal_length
sepal_length      0.685694      1.274315
petal_length      1.274315      3.116278
```

In [8]:
```
# Define x and y columns
x_col = 'sepal_length'
y_col = 'petal_length'

# Create scatter plot
plt.figure(figsize=(8, 5))
plt.scatter(data[x_col], data[y_col], color='purple', alpha=0.6)
plt.xlabel(x_col.capitalize())
plt.ylabel(y_col.capitalize())
plt.title(f"Scatter Plot of {x_col} vs {y_col}")
plt.grid(True)
plt.show()
```



In [12]:
```
# Select numeric columns (excluding species)
data_numeric = data.select_dtypes(include='number')

# Covariance matrix
cov_matrix = data_numeric.cov()
print("📉 Covariance Matrix (All Numeric Columns):\n")
print(cov_matrix)

# Correlation matrix
corr_matrix = data_numeric.corr()
print("\n📈 Correlation Matrix (All Numeric Columns):\n")
print(corr_matrix)
```

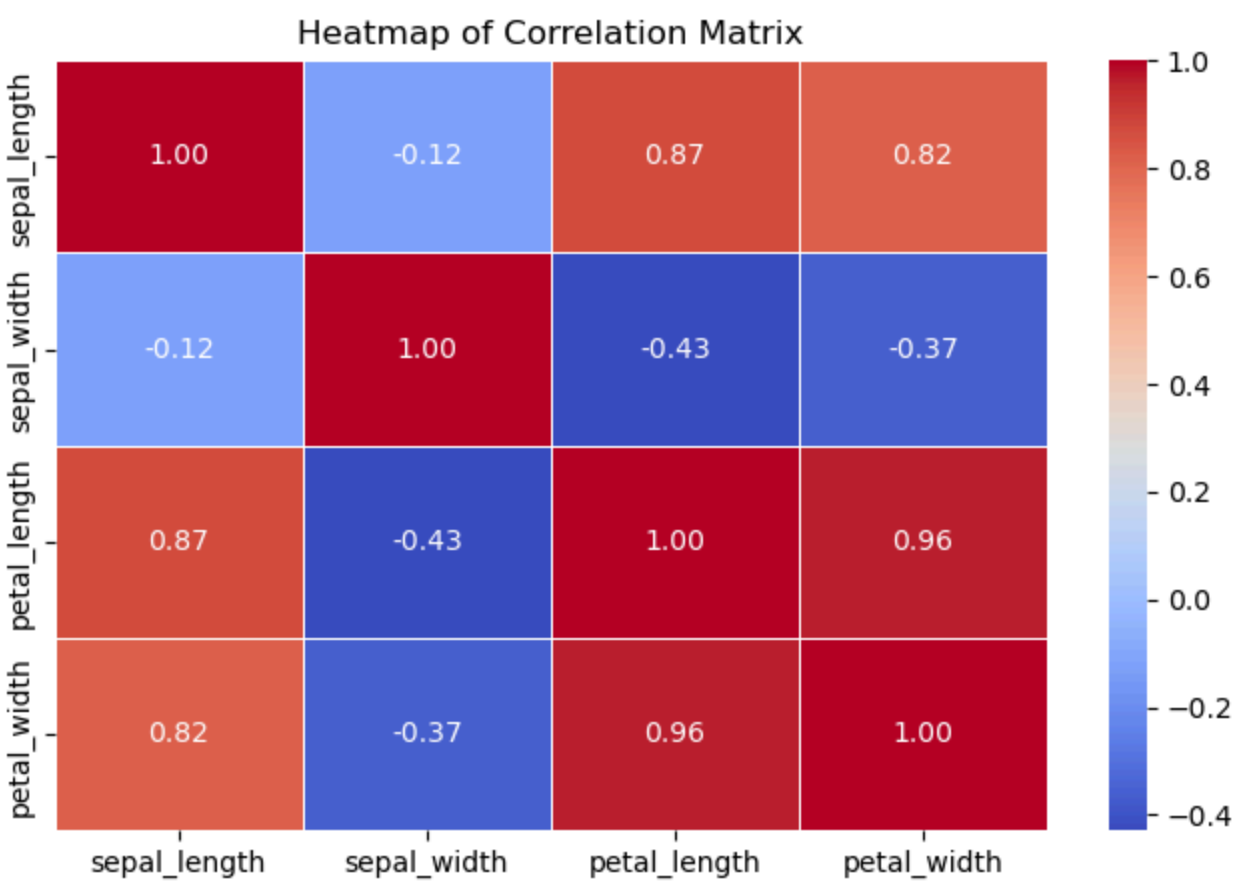
```
📉 Covariance Matrix (All Numeric Columns):

              sepal_length  sepal_width  petal_length  petal_width
sepal_length      0.685694    -0.042434      1.274315     0.516271
sepal_width      -0.042434     0.189979     -0.329656    -0.121639
petal_length      1.274315    -0.329656      3.116278     1.295609
petal_width       0.516271    -0.121639      1.295609     0.581006

📈 Correlation Matrix (All Numeric Columns):

              sepal_length  sepal_width  petal_length  petal_width
sepal_length      1.000000    -0.117570      0.871754     0.817941
sepal_width      -0.117570     1.000000     -0.428440    -0.366126
petal_length      0.871754    -0.428440      1.000000     0.962865
petal_width       0.817941    -0.366126      0.962865     1.000000
```

In [14]:
```
# Visualize the correlation matrix using a heatmap
plt.figure(figsize=(8, 5))
sns.heatmap(corr_matrix, annot=True, cmap='coolwarm', fmt=".2f", linewidths=0.5)
plt.title("Heatmap of Correlation Matrix")
plt.show()
```


Heatmap of Correlation Matrix
sepal_length
sepal_width
petal_length
petal_width
1.00
-0.12
0.87
0.82
-0.12
1.00
-0.43
-0.37
0.87
-0.43
1.00
0.96
0.82
-0.37
0.96
1.00
sepal_length
sepal_width
petal_length
petal_width
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4