

Iris Flowers Classification ML Project

The main objective of the project is to perform a basic supervised machine learning on the iris dataset using logistic regression as the classifier. For visualization, various plots such as the scatter plot, correlation heatmap and pair-plots have been used. Finally, predictions are made using the logistic regression function and accuracy score and a classification report is displayed.

```
In [4]: pip install -U notebook-as-pdf

Collecting notebook-as-pdf
  Downloading notebook_as_pdf-0.5.0-py3-none-any.whl (6.5 kB)
Collecting PyPDF2
  Downloading pypdf2-3.0.1-py3-none-any.whl (232 kB)
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Installing collected packages: PyPDF2, notebook-as-pdf
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In [6]: pip install pypeteer

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Note: you may need to restart the kernel to use updated packages.
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In [1]: !pip install nbconvert[webpdf]

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Installing collected packages: websockets, pyee, pypeteer
Successfully installed pyee-8.2.2 pypeteer-1.0.2 websockets-10.4
```

```
In [1]: !pip install seaborn

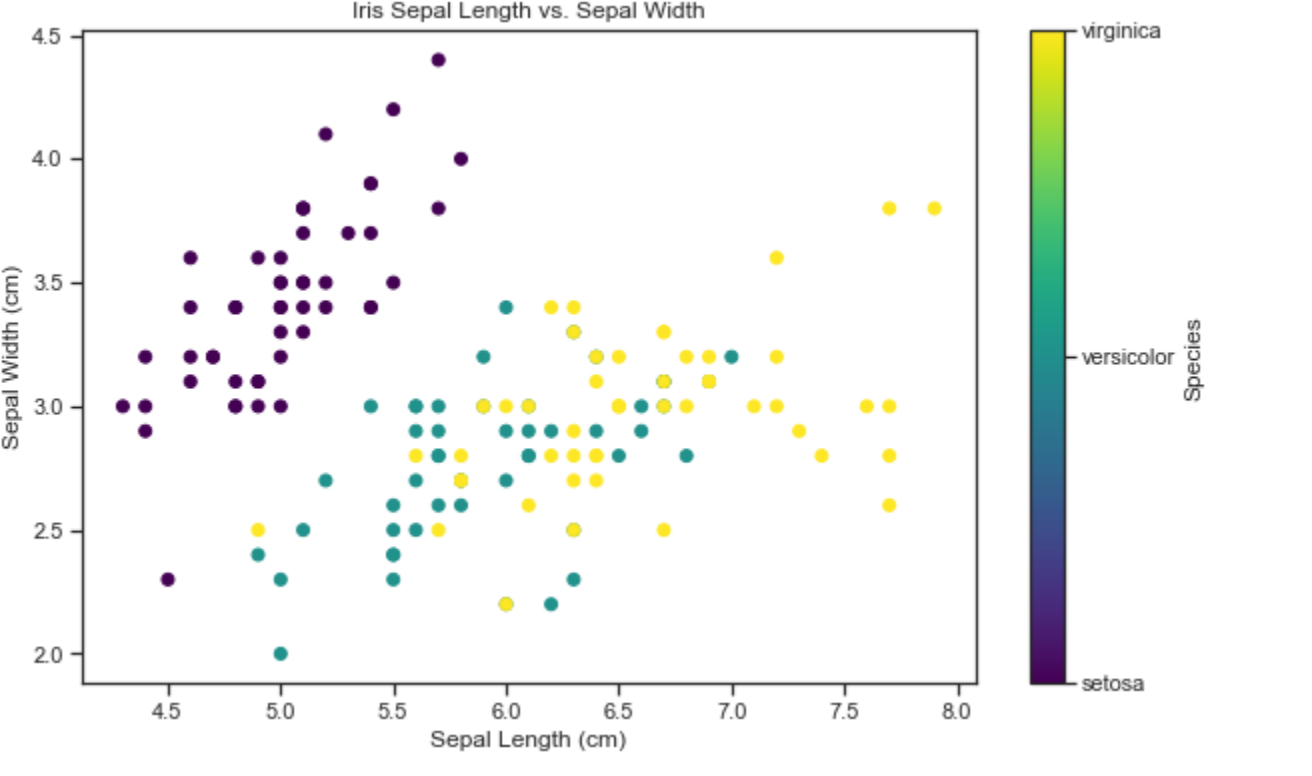
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```

```
In [56]: import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
log_model = LogisticRegression(solver='lbfgs', max_iter=1000)
```

```
In [20]: # Load the Iris dataset
from sklearn.datasets import load_iris
iris = load_iris()
```

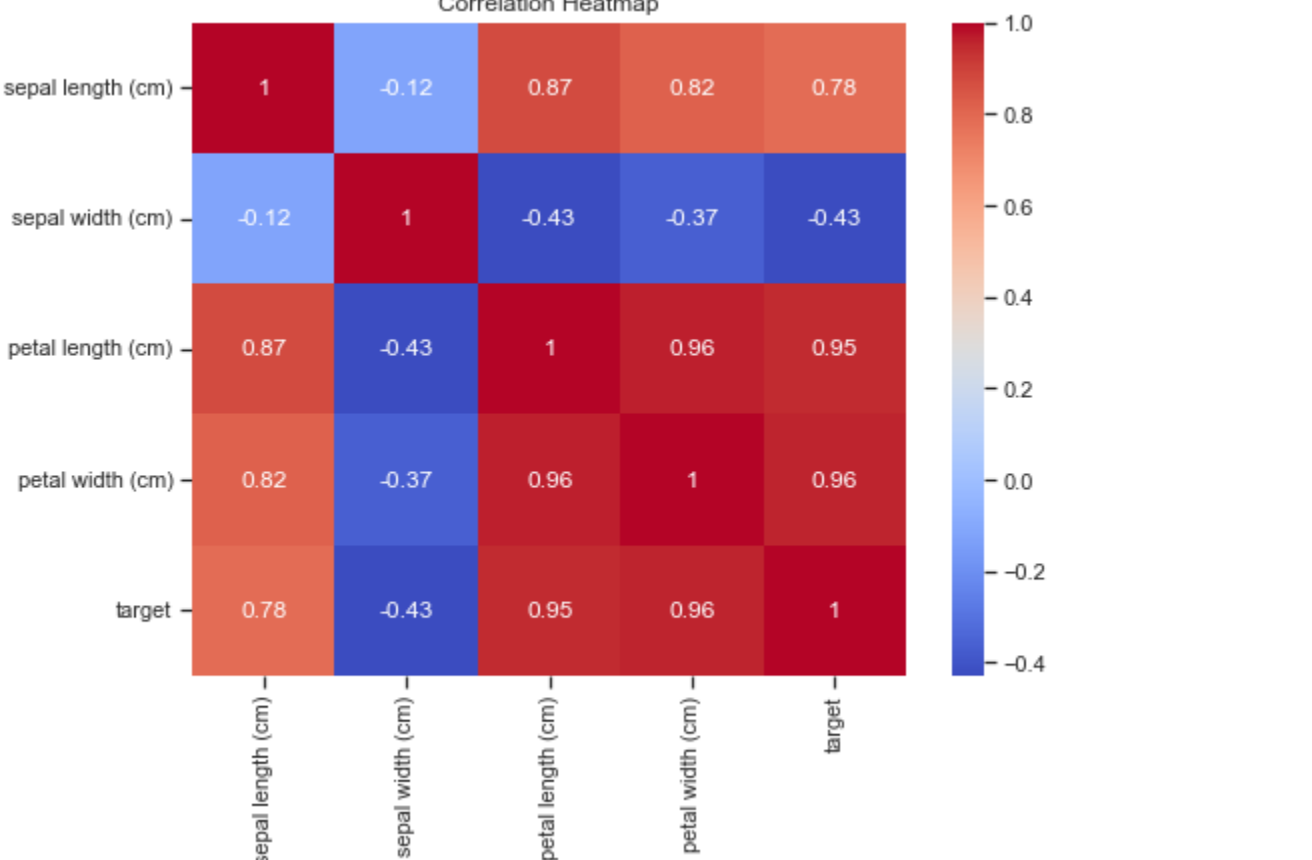
```
In [21]: # Create a DataFrame from the iris data
iris_df = pd.DataFrame(data=iris.data, columns=iris.feature_names)
iris_df['target'] = iris.target
```

```
In [22]: # Visualize the data
plt.figure(figsize=(10, 6))
plt.scatter(iris_df['sepal length (cm)'], iris_df['sepal width (cm)'],
            c=iris_df['target'], cmap='viridis')
plt.xlabel('Sepal Length (cm)')
plt.ylabel('Sepal Width (cm)')
plt.title('Iris Sepal Length vs. Sepal Width')
plt.colorbar(ticks=[0, 1, 2], label='Species',
             format=plt.FuncFormatter(lambda val, _ : iris.target_names[int(val)]))
plt.show()
```

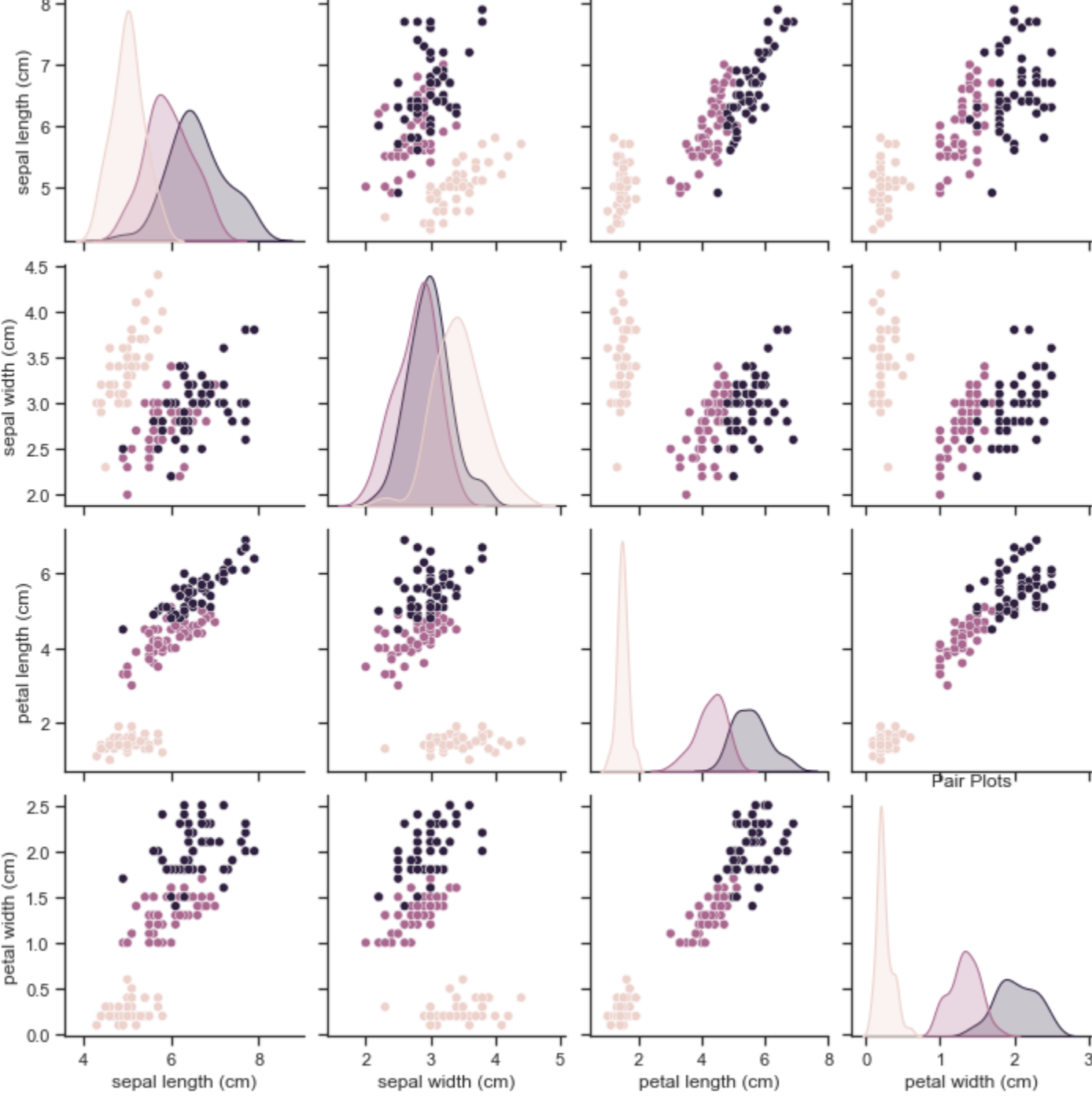


```
In [23]: # Calculate the correlation matrix
corr_matrix = iris_df.corr()
```

```
In [24]: # Plot the correlation heatmap
plt.figure(figsize=(8, 6))
sns.heatmap(corr_matrix, annot=True, cmap='coolwarm')
plt.title('Correlation Heatmap')
plt.show()
```



```
In [25]: # Plot pair plots
sns.set(style='ticks')
sns.pairplot(iris_df, hue='target')
plt.title('Pair Plots')
plt.show()
```



```
In [26]: # Split the data into training and test sets
X_train, X_test, y_train, y_test = train_test_split(
    iris_df[iris.feature_names], iris_df['target'], test_size=0.2, random_state=42)
```

```
In [27]: # Create a logistic regression model
model = LogisticRegression()
```

```
In [32]: log_reg = LogisticRegression(solver='lbfgs', class_weight='balanced', max_iter=10000)
```

```
In [33]: # Train the model
model.fit(X_train, y_train)
```

```
Out[33]: LogisticRegression()
```

```
In [45]: # Make predictions on the test set
y_pred = model.predict(X_test)
y_pred
```

```
Out[45]: array([0, 1, 1, 1, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1,
        1, 1, 0])
```

```
In [42]: # Evaluate the model
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
Accuracy: 1.0
```

```
In [57]: classification_report = classification_report(y_test, y_pred)
print("Classification Report:\n", classification_report)
```

	precision	recall	f1-score	support
0	1.00	1.00	1.00	15
1	1.00	1.00	1.00	10
accuracy				25
macro avg	1.00	1.00	1.00	25
weighted avg	1.00	1.00	1.00	25