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import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import LabelEncoder, OneHotEncoder
from sklearn.datasets import load_iris

# Load the Iris dataset
iris = load_iris()

# Create DataFrame from the Iris data
df = pd.DataFrame(data=iris.data, columns=iris.feature_names)
df['Species'] = iris.target_names[iris.target]

# Display the original dataset
print("Original Dataset:")
print(df.head())

# Data Encoding

# One-Hot Encoding
one_hot_encoder = OneHotEncoder()
one_hot_encoded =
one_hot_encoder.fit_transform(df[['Species']]).toarray()
one_hot_df = pd.DataFrame(one_hot_encoded,
columns=one_hot_encoder.get_feature_names_out(['Species']))

# Label Encoding
label_encoder = LabelEncoder()
label_encoded = label_encoder.fit_transform(df['Species'])
label_df = pd.DataFrame(label_encoded,
columns=['Species_Label_Encoded'])

# Display the encoded datasets
print("\nOne-Hot Encoded Dataset:")
print(one_hot_df.head())

print("\nLabel Encoded Dataset:")
print(label_df.head())

# Visualization of Encoded Data
fig, axs = plt.subplots(1, 2, figsize=(12, 5))

# One-Hot Encoded Dataset Visualization
sns.heatmap(one_hot_df, ax=axs[0], cmap='coolwarm', cbar=False)
axs[0].set_title('One-Hot Encoded Dataset')

# Label Encoded Dataset Visualization

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sns.countplot(data=label_df, x='Species_Label_Encoded', ax=axes[1],
palette='coolwarm')
axes[1].set_title('Label Encoded Dataset')

plt.tight_layout()
plt.show()
```

One-Hot Encoded Dataset:

	Species_setosa	Species_versicolor	Species_virginica
0	1.0	0.0	0.0
1	1.0	0.0	0.0
2	1.0	0.0	0.0
3	1.0	0.0	0.0
4	1.0	0.0	0.0

Label Encoded Dataset:

	Species_Label_Encoded
0	0
1	0
2	0
3	0
4	0

