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import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.datasets import load_iris
from sklearn.decomposition import PCA
from sklearn.preprocessing import StandardScaler

# Load the Iris dataset
iris = load_iris()
X = iris.data
y = iris.target

# Standardize the features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

# Apply PCA for dimensionality reduction
pca = PCA(n_components=2) # Reduce to 2 dimensions
X_pca = pca.fit_transform(X_scaled)

# Create DataFrame for the reduced data
df_pca = pd.DataFrame(data=X_pca, columns=['PC1', 'PC2'])
df_pca['Target'] = y

# Display the original dataset
print("Original Dataset:")
print(pd.DataFrame(data=X, columns=iris.feature_names).head())

# Display the reduced dataset
print("\nReduced Dataset:")
print(df_pca.head())

# Visualize the reduced dataset using Seaborn
plt.figure(figsize=(8, 6))
sns.scatterplot(data=df_pca, x='PC1', y='PC2', hue='Target',
                palette='viridis', legend='full')
plt.title('PCA Dimensionality Reduction with Seaborn')
plt.xlabel('PC1')
plt.ylabel('PC2')
plt.grid(True)
plt.show()
```

Original Dataset:

	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

Reduced Dataset:

	PC1	PC2	Target
0	-2.264703	0.480027	0
1	-2.080961	-0.674134	0
2	-2.364229	-0.341908	0
3	-2.299384	-0.597395	0
4	-2.389842	0.646835	0

