```python
[9]:    from sklearn import datasets
        import pandas as pd
        from sklearn.preprocessing import StandardScaler
        from sklearn.decomposition import PCA
        import seaborn as sns
        import matplotlib.pyplot as plt

        # Load Iris Dataset
        iris = datasets.load_iris()
        df = pd.DataFrame(iris['data'], columns=iris['feature_names'])
        print(df.head())
```
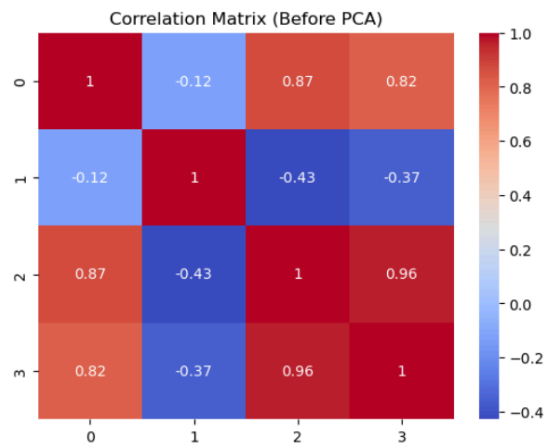
```
   sepal length (cm)  sepal width (cm)  petal length (cm)  petal width (cm)
0                5.1               3.5                1.4               0.2
1                4.9               3.0                1.4               0.2
2                4.7               3.2                1.3               0.2
3                4.6               3.1                1.5               0.2
4                5.0               3.6                1.4               0.2
```

```python
[18]:   # Standardize the Data
        scaler = StandardScaler()
        scaled_data = pd.DataFrame(scaler.fit_transform(df), columns=df.columns)
```

```python
[17]:   # Correlation before PCA
        plt.figure(figsize=(6, 4))
        sns.heatmap(scaled_data.corr(), annot=True, cmap='coolwarm')
        plt.title("Correlation Matrix (Before PCA)")
        plt.show()
```


Correlation Matrix (Before PCA)

```python
[13]:   # PCA Transformation
        pca = PCA(n_components=3)
        pca.fit(scaled_data)
        data_pca = pca.transform(scaled_data)

        data_pca = pd.DataFrame(data_pca, columns=['PC1', 'PC2', 'PC3'])
        print(data_pca.head())
```

```
        PC1       PC2       PC3
0 -2.264703  0.480027  0.127706
1 -2.080961 -0.674134  0.234609
2 -2.364229 -0.341908 -0.044201
3 -2.299384 -0.597395 -0.091290
4 -2.389842  0.646835 -0.015738
```

```
[14]:  # Correlation after PCA
       plt.figure(figsize=(6, 4))
       sns.heatmap(data_pca.corr(), annot=True,fmt='.2f', cmap='Greens')
       plt.title("Correlation Matrix (After PCA)")
       plt.show()
```


Correlation Matrix (After PCA)