```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import classification_report, accuracy_score
```

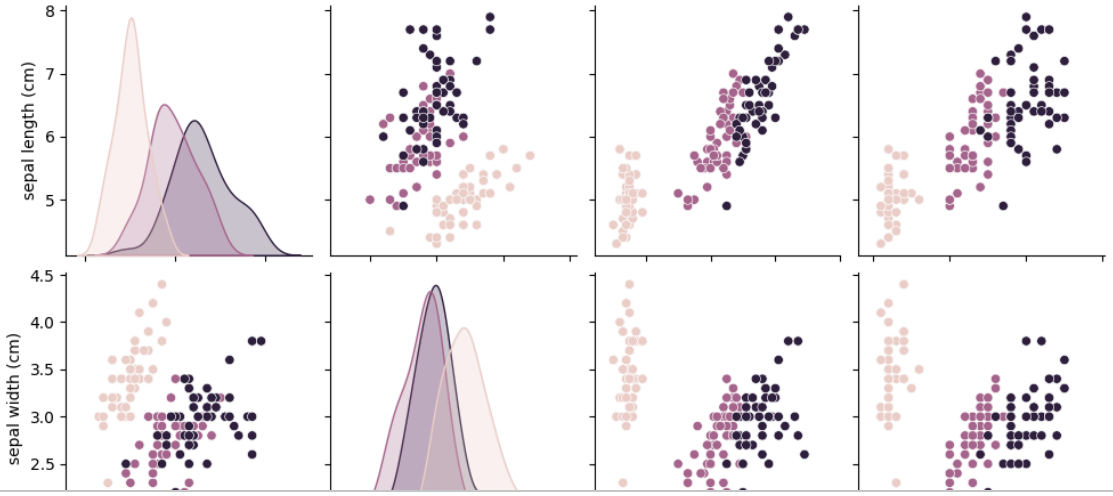
import pandas as pd import matplotlib.pyplot as plt import seaborn as sns from sklearn.model_selection import train_test_split from sklearn.neighbors import KNeighborsClassifier from sklearn.metrics import classification_report, accuracy_score


```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import classification_report, accuracy_score
```

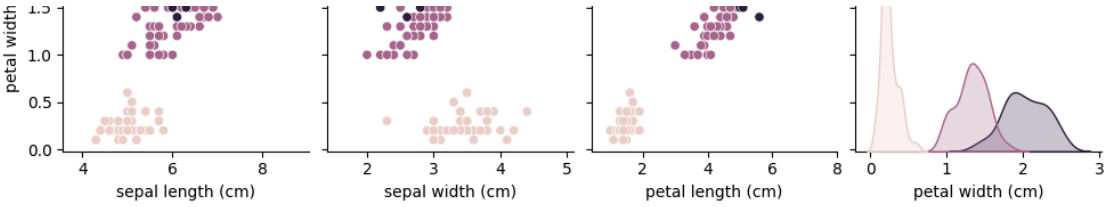

```
# Sample dataset (Iris)
from sklearn.datasets import load_iris

data = load_iris()
df = pd.DataFrame(data.data, columns=data.feature_names)
df['target'] = data.target

# Show first 5 rows
print(df.head())

# Visualization
sns.pairplot(df, hue="target")
plt.show()

# Train test split
X = df.drop('target', axis=1)
y = df['target']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,

# Model
model = KNeighborsClassifier(n_neighbors=3)
model.fit(X_train, y_train)

# Predict
y_pred = model.predict(X_test)
```

```
# Results
print("Accuracy:", accuracy_score(y_test, y_pred))
print("\nClassification Report:\n", classification_report(y_test, y_pred
```

```
   sepal length (cm)  sepal width (cm)  petal length (cm)  petal width (
0                5.1               3.5                1.4
1                4.9               3.0                1.4
2                4.7               3.2                1.3
3                4.6               3.1                1.5
4                5.0               3.6                1.4

   target
0       0
1       0
2       0
3       0
4       0
```




```
# Feature correlation heatmap
sns.heatmap(df.corr(), annot=True, cmap='coolwarm')
plt.title("Feature Correlation Heatmap")
plt.show()

# Countplot of target classes
sns.countplot(x='target', data=df)
plt.title("Number of Samples per Class")
plt.show()
```




```
Accuracy: 1.0

Classification Report:
              precision    recall  f1-score   support

           0       1.00      1.00      1.00        10
           1       1.00      1.00      1.00         9
           2       1.00      1.00      1.00        11

    accuracy                           1.00        30
```

```
    accuracy                           1.00        30
   macro avg       1.00      1.00      1.00        30
weighted avg       1.00      1.00      1.00        30
```