

Write a program to demonstrate SVM with different kernel methods.

```
In [1]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

```
In [2]: # Load the iris dataset
from sklearn.datasets import load_iris
iris = load_iris()
```

```
In [3]: X = iris.data
y = iris.target
```

```
In [4]: # Split the dataset into training and testing sets
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

```
In [6]: # Define the SVM models with different kernels
from sklearn import svm
kernels = ['linear', 'poly', 'rbf', 'sigmoid']
models = {}
for kernel in kernels:
    model = svm.SVC(kernel=kernel)
    model.fit(X_train, y_train)
    models[kernel] = model
    y_pred = model.predict(X_test)
```

```
In [7]: # Print the classification report and confusion matrix
from sklearn.metrics import classification_report, confusion_matrix
print(f"Kernel: {kernel}")
```

Kernel: sigmoid

```
In [8]: print(classification_report(y_test, y_pred, target_names=iris.target_names))
print("Confusion Matrix:")
print(confusion_matrix(y_test, y_pred))
print("*"*50)
```

	precision	recall	f1-score	support
setosa	0.00	0.00	0.00	10
versicolor	0.30	1.00	0.46	9
virginica	0.00	0.00	0.00	11
accuracy			0.30	30
macro avg	0.10	0.33	0.15	30
weighted avg	0.09	0.30	0.14	30

Confusion Matrix:

```
[[ 0 10  0]
 [ 0  9  0]
 [ 0 11  0]]
```

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d:\ML PROJECT\venv\lib\site-packages\sklearn\metrics\\_classification.py:1344: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

\_warn\_prf(average, modifier, msg\_start, len(result))

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