```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
from sklearn.datasets import load_iris, load_diabetes
import pandas as pd
from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
from sklearn.metrics import ConfusionMatrixDisplay
import seaborn as sns
import matplotlib.pyplot as plt
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.metrics import accuracy_score, confusion_matrix
from sklearn.preprocessing import LabelEncoder


from google.colab import files
uploaded = files.upload()
```

Choose Files iris.csv

- **iris.csv**(text/csv) - 4617 bytes, last modified: 4/21/2025 - 100% done

```
Saving iris.csv to iris.csv
```

```
df = pd.read_csv('iris.csv')
df
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica
146	6.3	2.5	5.0	1.9	Iris-virginica
147	6.5	3.0	5.2	2.0	Iris-virginica
148	6.2	3.4	5.4	2.3	Iris-virginica
149	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 5 columns

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
le = LabelEncoder()
df['species'] = le.fit_transform(df['species'])


X = df.drop('species', axis=1)
y = df['species']


X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)


svm_linear = SVC(kernel='linear')
svm_linear.fit(X_train, y_train)
y_pred_linear = svm_linear.predict(X_test)


print("Linear Kernel SVM:")
print("Accuracy:", accuracy_score(y_test, y_pred_linear))
print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred_linear))
```

```
print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred_linear))
```

```
Linear Kernel SVM:
Accuracy: 1.0
Confusion Matrix:
 [[10  0  0]
 [ 0  9  0]
 [ 0  0 11]]
```

```
confusion_matrix(y_test, y_pred_linear)
```

```
array([[10,  0,  0],
       [ 0,  9,  0],
       [ 0,  0, 11]])
```

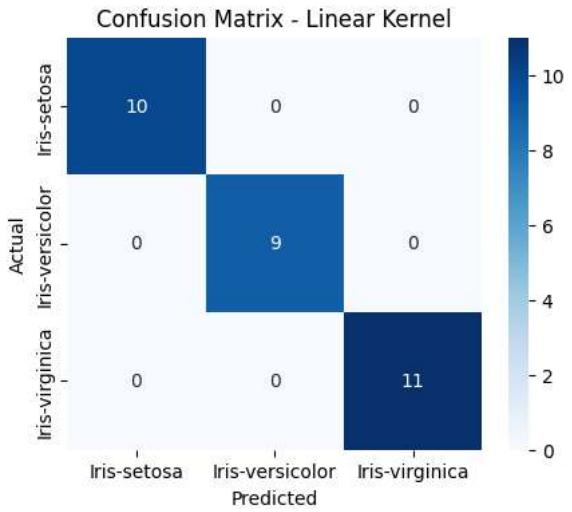
```
svm_rbf = SVC(kernel='rbf')
svm_rbf.fit(X_train, y_train)
y_pred_rbf = svm_rbf.predict(X_test)
```

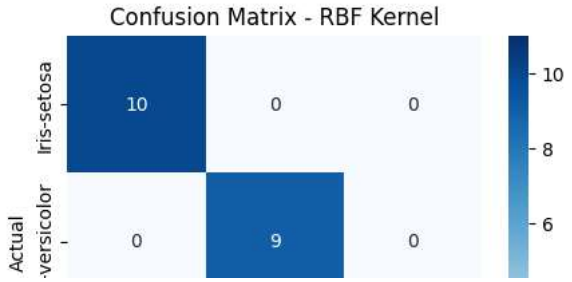
```
print("\nRBF Kernel SVM:")
print("Accuracy:", accuracy_score(y_test, y_pred_rbf))
print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred_rbf))
```

```

RBF Kernel SVM:
Accuracy: 1.0
Confusion Matrix:
 [[10  0  0]
 [ 0  9  0]
 [ 0  0 11]]
```

```
import seaborn as sns
import matplotlib.pyplot as plt
def plot_confusion_matrix(y_true, y_pred, kernel_name):
    cm = confusion_matrix(y_true, y_pred)
    plt.figure(figsize=(5,4))
    sns.heatmap(cm, annot=True, fmt='d', cmap='Blues',
                xticklabels=le.classes_, yticklabels=le.classes_)
    plt.title(f'Confusion Matrix - {kernel_name} Kernel')
    plt.xlabel('Predicted')
    plt.ylabel('Actual')
    plt.show()
plot_confusion_matrix(y_test, y_pred_linear, "Linear")
plot_confusion_matrix(y_test, y_pred_rbf, "RBF")
```


Confusion Matrix - Linear Kernel
Actual
Iris-setosa
Iris-versicolor
Iris-virginica
10
0
0
0
9
0
0
0
11
Iris-setosa
Iris-versicolor
Iris-virginica
Predicted
10
8
6
4
2
0


Confusion Matrix - RBF Kernel
Actual
Iris-setosa
-versicolor
10
0
0
0
9
0
10
8
6