Machine Learning Lab – 20ISL68A

Program 6 - Develop a program to construct Support Vector Machine considering a Sample Dataset.

Step 1: Importing Libraries

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn import svm, datasets
```

Step 2: Loading the Dataset

```
iris = datasets.load_iris()
```

Step 3: Considering only first two features (Sepal Length and Sepal Width)

```
X = iris.data[:, :2]
y = iris.target
```

Step 4: Creating instance of SVM

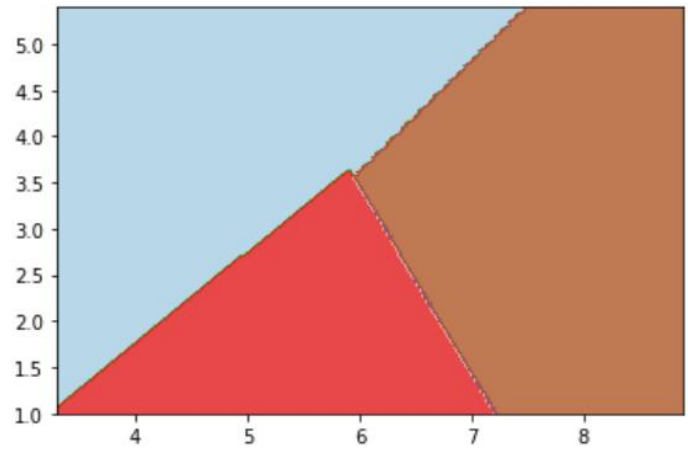
```
svc = svm.SVC(kernel='linear').fit(X, y)
```

Step 5: Creating a mesh to plot

```
x_min, x_max = X[:, 0].min() - 1, X[:, 0].max() + 1
y_min, y_max = X[:, 1].min() - 1, X[:, 1].max() + 1
h = (x_max / x_min)/100
xx, yy = np.meshgrid(np.arange(x_min, x_max, h), np.arange(y_min, y_max, h))
```

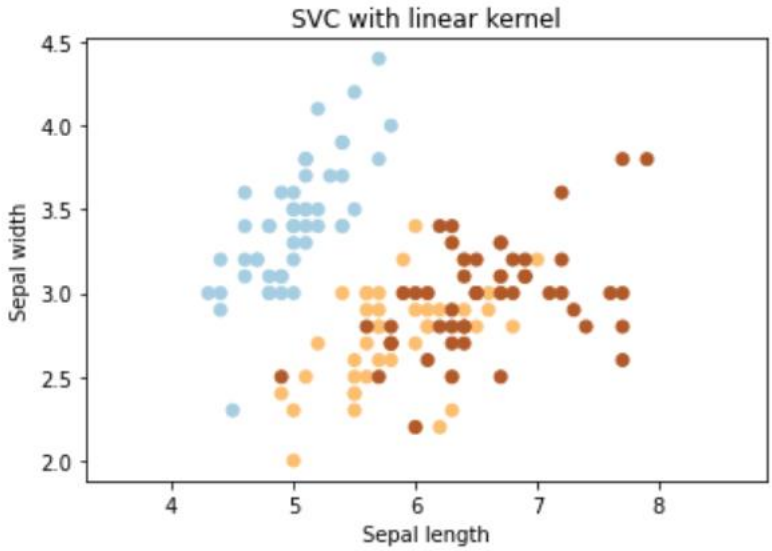
Step 6: Plotting the graph

```
plt.subplot(1, 1, 1)
Z = svc.predict(np.c_[xx.ravel(), yy.ravel()])
Z = Z.reshape(xx.shape)
plt.contourf(xx, yy, Z, cmap=plt.cm.Paired, alpha=0.8)
```



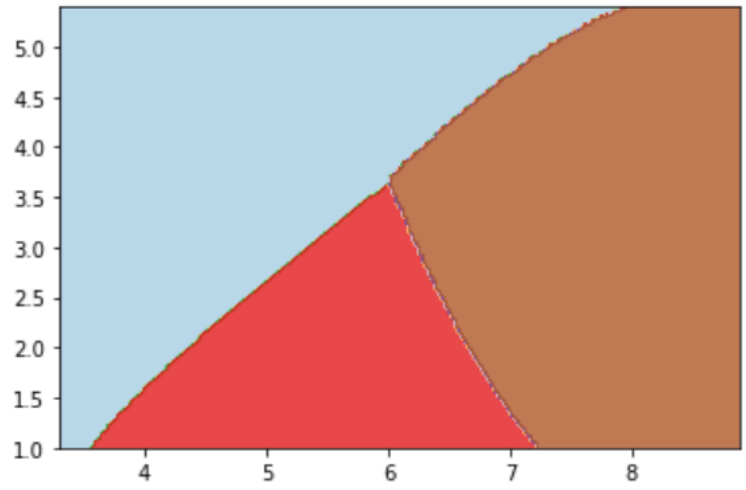
Step 7: Plotting the data values

```
plt.scatter(X[:, 0], X[:, 1], c=y, cmap=plt.cm.Paired)
plt.xlabel('Sepal length')
plt.ylabel('Sepal width')
plt.xlim(xx.min(), xx.max())
plt.title('SVC with linear kernel')
plt.show()
```



Different types of Kernels

rbf



sigmoid

poly