Commands | + Code | + Text | Run all

RAM
Disk

Files

..
sample_data
BankNote_Authentication.csv
recipes_muffins_cupcakes - recipes...

Disk 68.33 GB available

[11] ✓ 2s

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn import svm
from sklearn.model_selection import train_test_split
from sklearn.metrics import confusion_matrix, classification_report

sns.set(font_scale=1.2)

recipes = pd.read_csv('recipes_muffins_cupcakes - recipes_muffins_cupcakes.csv')

print(recipes.head())
print(recipes.shape)

sns.lmplot(x='Sugar', y='Flour', data=recipes, hue='Type', palette='Set1', fit_reg=False, scatter_kws={"s": 70})
plt.title("Muffins vs Cupcakes (Raw Data)")
plt.show()

sugar_flour = recipes[['Sugar', 'Flour']].values
type_label = np.where(recipes['Type'] == 'Muffin', 0, 1)

model = svm.SVC(kernel='linear')
model.fit(sugar_flour, type_label)

w = model.coef_[0]
a = -w[0] / w[1]
xx = np.linspace(5, 30)
yy = a * xx - (model.intercept_[0] / w[1])

b = model.support_vectors_[0]
yy_down = a * xx + (b[1] - a * b[0])
b = model.support_vectors_[-1]
yy_up = a * xx + (b[1] - a * b[0])

sns.lmplot(x='Sugar', y='Flour', data=recipes, hue='Type', palette='Set1', fit_reg=False, scatter_kws={"s": 70})
plt.plot(xx, yy, linewidth=2, color='black')
plt.plot(xx, yy_down, 'k--')
plt.plot(xx, yy_up, 'k--')
plt.scatter(model.support_vectors_[:, 0], model.support_vectors_[:, 1], s=100, facecolors='none', edgecolors='k')
```

Start | Variables | Terminal

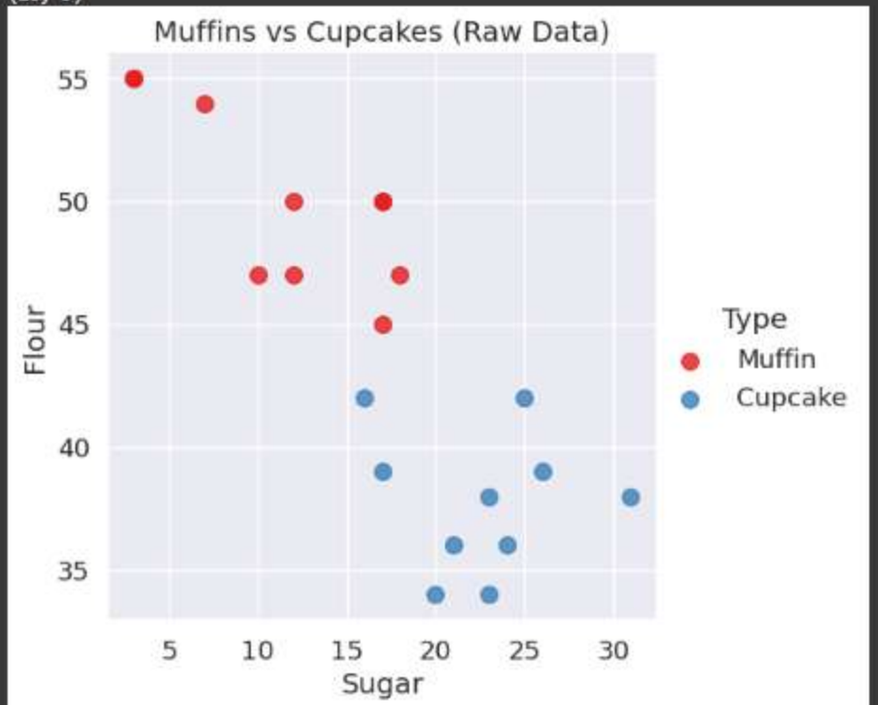
10:47 AM | Python 3

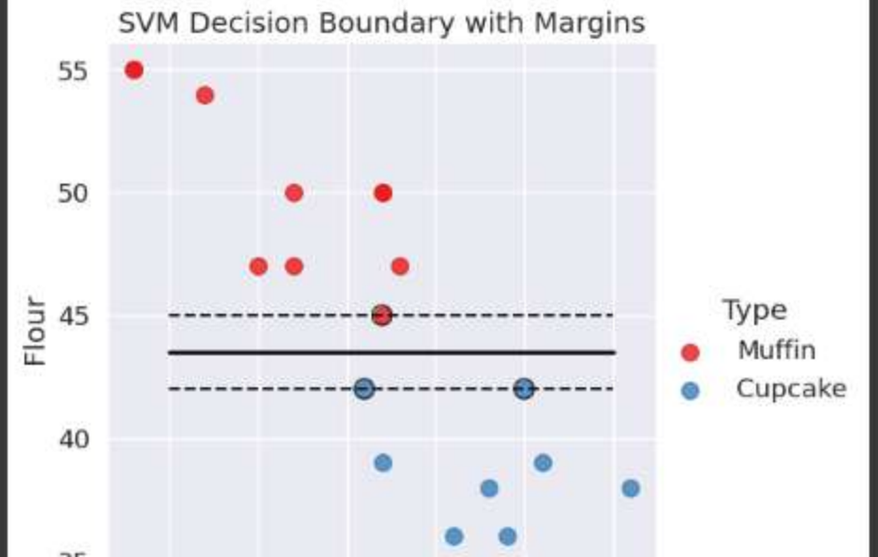
[11] ✓ 2s

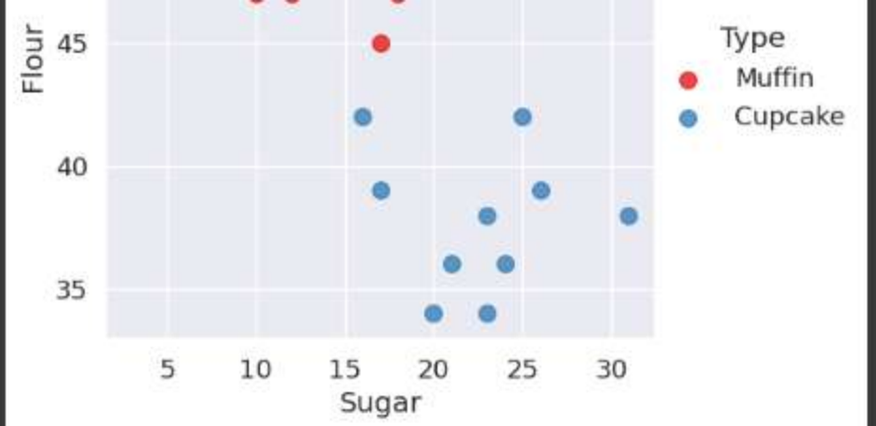
```
print(recipes.head())
print(recipes.shape)

sns.lmplot(x='Sugar', y='Flour', data=recipes, hue='Type', palette='Set1', fit_reg=False, scatter_kws={"s": 70})
plt.title("Muffins vs Cupcakes (Raw Data)")
plt.show()

sugar_flour = recipes[['Sugar', 'Flour']].values
type_label = np.where(recipes['Type'] == 'Muffin', 0, 1)

model = svm.SVC(kernel='linear')
model.fit(sugar_flour, type_label)

w = model.coef_[0]
a = -w[0] / w[1]
xx = np.linspace(5, 30)
yy = a * xx - (model.intercept_[0] / w[1])

b = model.support_vectors_[0]
yy_down = a * xx + (b[1] - a * b[0])
b = model.support_vectors_[-1]
yy_up = a * xx + (b[1] - a * b[0])

sns.lmplot(x='Sugar', y='Flour', data=recipes, hue='Type', palette='Set1', fit_reg=False, scatter_kws={"s": 70})
plt.plot(xx, yy, linewidth=2, color='black')
plt.plot(xx, yy_down, 'k--')
plt.plot(xx, yy_up, 'k--')
plt.scatter(model.support_vectors_[:, 0], model.support_vectors_[:, 1], s=100, facecolors='none', edgecolors='k')
plt.title("SVM Decision Boundary with Margins")
plt.show()

x_train, x_test, y_train, y_test = train_test_split(sugar_flour, type_label, test_size=0.2, random_state=42)

model1 = svm.SVC(kernel='linear')
model1.fit(x_train, y_train)
pred = model1.predict(x_test)

print(pred)
print(confusion_matrix(y_test, pred))
print(classification_report(y_test, pred))
```

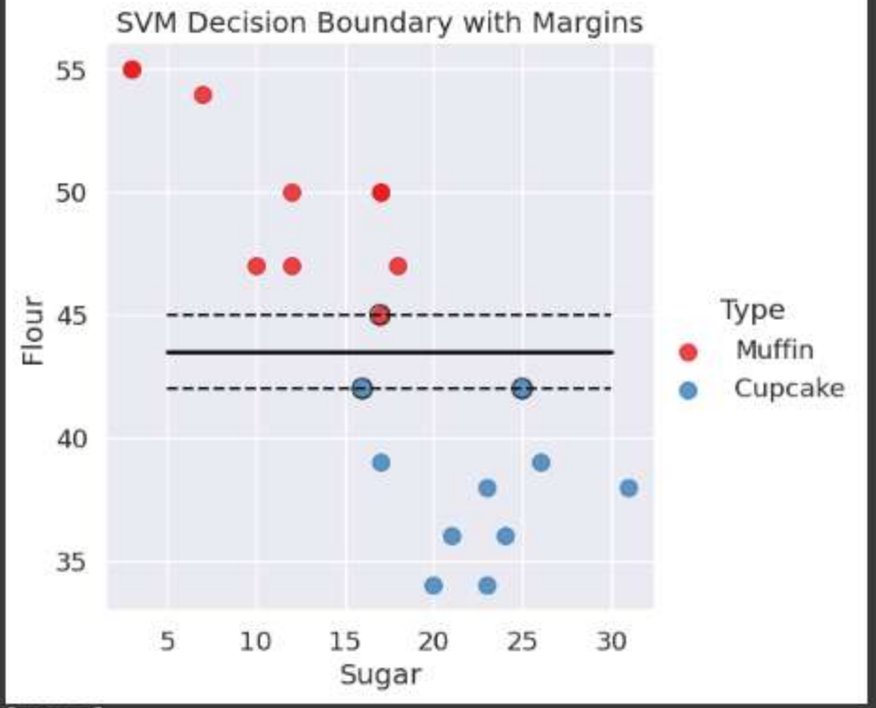
	Type	Flour	Milk	Sugar	Butter	Egg	Baking Powder	Vanilla	Salt
0	Muffin	55	28	3	7	5	2	0	0
1	Muffin	47	24	12	6	9	1	0	0
2	Muffin	47	23	18	6	4	1	0	0
3	Muffin	45	11	17	17	8	1	0	0
4	Muffin	50	25	12	6	5	2	1	0

(20, 9)










```
[0 1 0 0]
[[2 0]
 [1 1]]
```

	precision	recall	f1-score	support
0	0.67	1.00	0.80	2
1	1.00	0.50	0.67	2
accuracy			0.75	4
macro avg	0.83	0.75	0.73	4
weighted avg	0.83	0.75	0.73	4