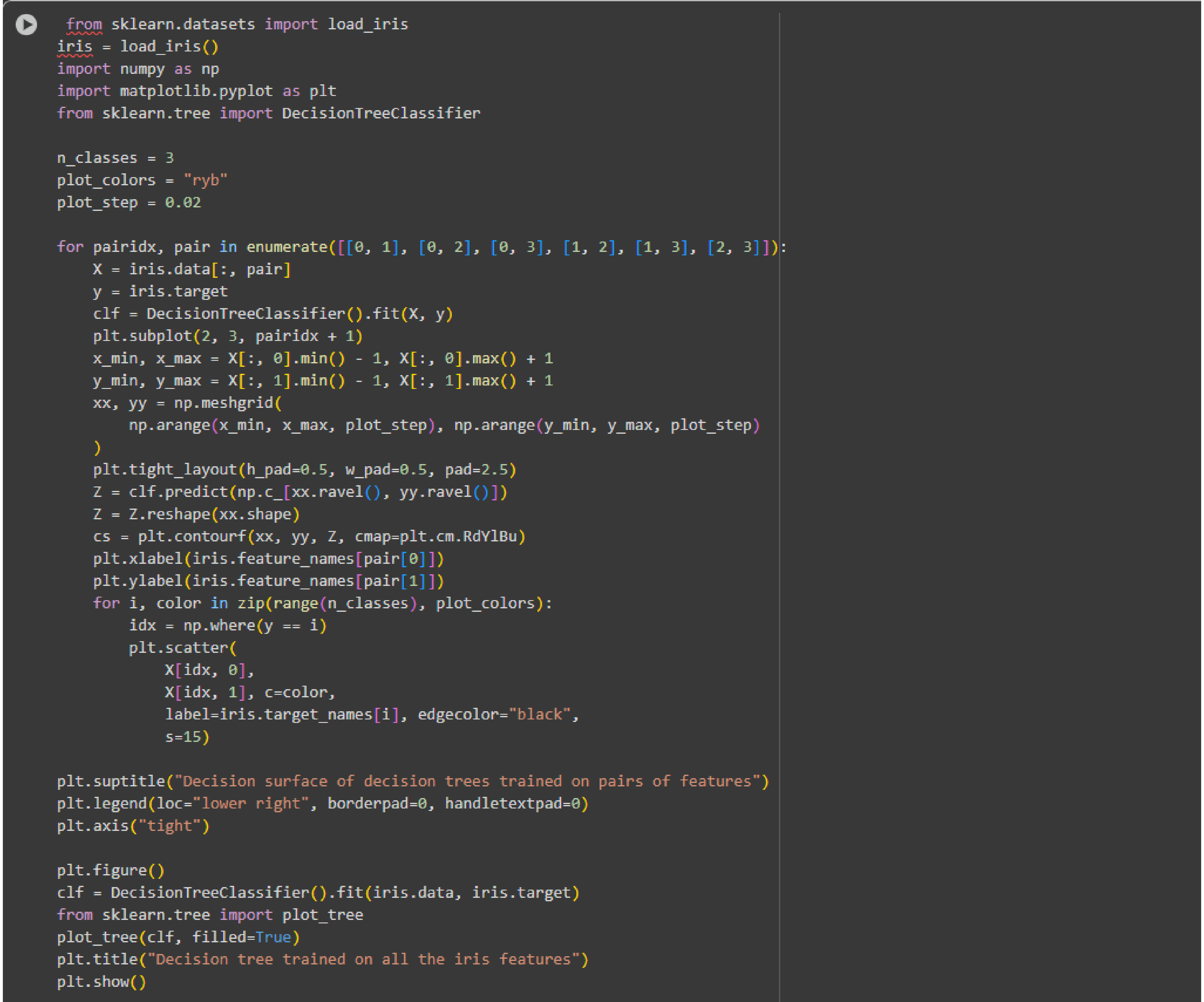
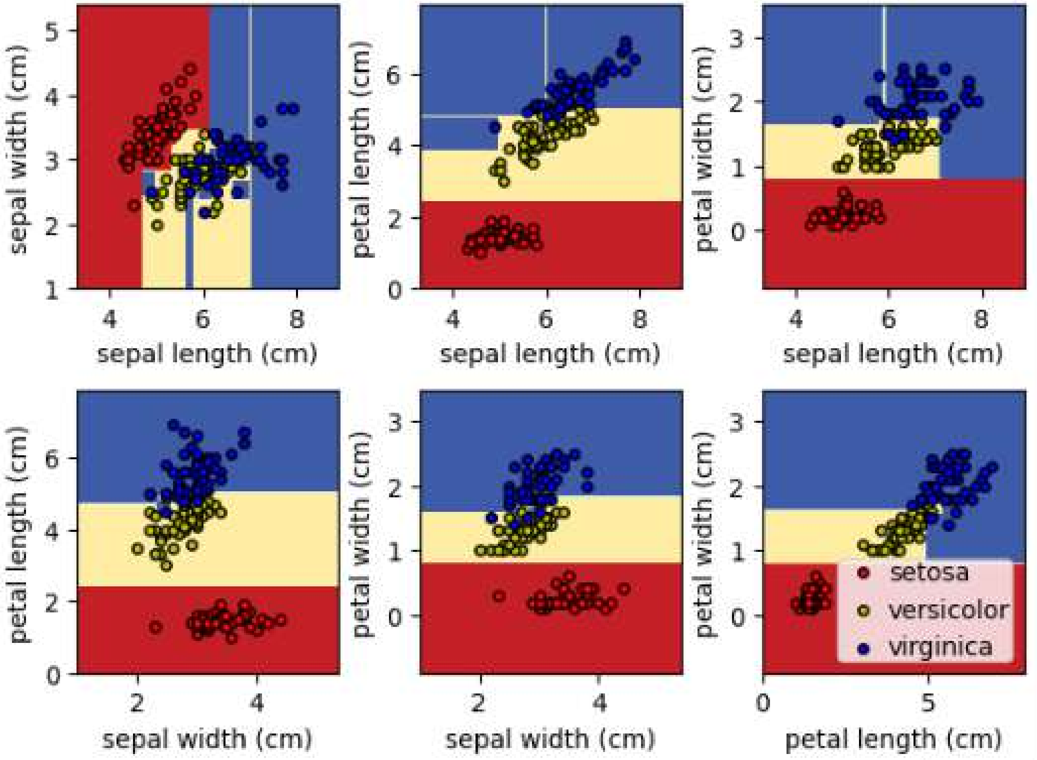
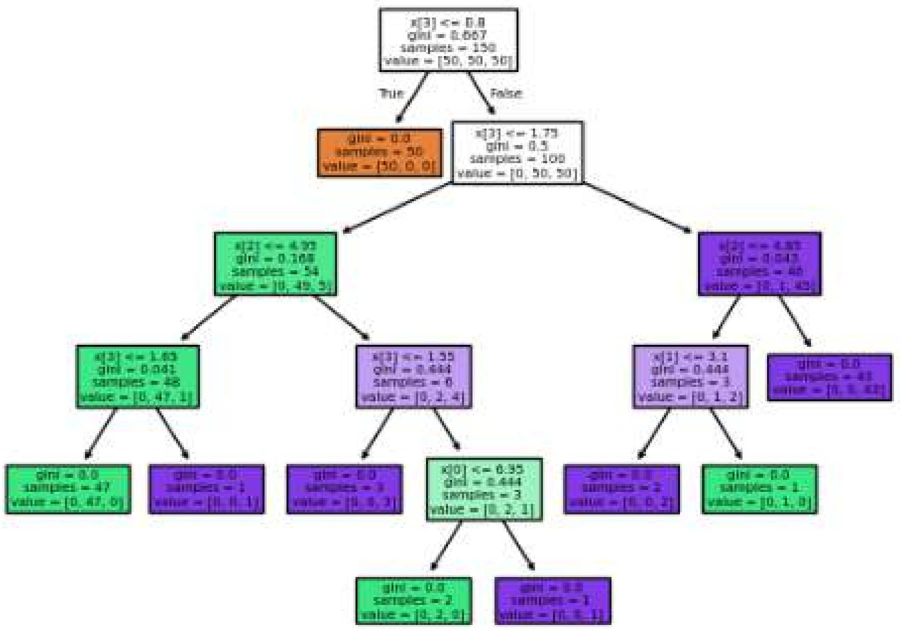


```
 from sklearn.datasets import load_iris
iris = load_iris()
import numpy as np
import matplotlib.pyplot as plt
from sklearn.tree import DecisionTreeClassifier

n_classes = 3
plot_colors = "ryb"
plot_step = 0.02

for pairidx, pair in enumerate([[0, 1], [0, 2], [0, 3], [1, 2], [1, 3], [2, 3]]):
    X = iris.data[:, pair]
    y = iris.target
    clf = DecisionTreeClassifier().fit(X, y)
    plt.subplot(2, 3, pairidx + 1)
    x_min, x_max = X[:, 0].min() - 1, X[:, 0].max() + 1
    y_min, y_max = X[:, 1].min() - 1, X[:, 1].max() + 1
    xx, yy = np.meshgrid(
        np.arange(x_min, x_max, plot_step), np.arange(y_min, y_max, plot_step)
    )
    plt.tight_layout(h_pad=0.5, w_pad=0.5, pad=2.5)
    Z = clf.predict(np.c_[xx.ravel(), yy.ravel()])
    Z = Z.reshape(xx.shape)
    cs = plt.contourf(xx, yy, Z, cmap=plt.cm.RdYlBu)
    plt.xlabel(iris.feature_names[pair[0]])
    plt.ylabel(iris.feature_names[pair[1]])
    for i, color in zip(range(n_classes), plot_colors):
        idx = np.where(y == i)
        plt.scatter(
            X[idx, 0],
            X[idx, 1], c=color,
            label=iris.target_names[i], edgecolor="black",
            s=15)

plt.suptitle("Decision surface of decision trees trained on pairs of features")
plt.legend(loc="lower right", borderpad=0, handletextpad=0)
plt.axis("tight")

plt.figure()
clf = DecisionTreeClassifier().fit(iris.data, iris.target)
from sklearn.tree import plot_tree
plot_tree(clf, filled=True)
plt.title("Decision tree trained on all the iris features")
plt.show()
```

Decision surface of decision trees trained on pairs of features



Decision tree trained on all the iris features



x[3] <= 0.8
gini = 0.667
samples = 150
value = [50, 50, 50]
True
False
gini = 0.0
samples = 50
value = [50, 0, 0]
x[3] <= 1.75
gini = 0.5
samples = 100
value = [0, 50, 50]
x[2] <= 4.95
gini = 0.168
samples = 54
value = [0, 49, 5]
x[2] <= 4.85
gini = 0.043
samples = 46
value = [0, 1, 45]
x[3] <= 1.65
gini = 0.041
samples = 48
value = [0, 47, 1]
x[3] <= 1.55
gini = 0.444
samples = 6
value = [0, 2, 4]
x[1] <= 3.1
gini = 0.444
samples = 3
value = [0, 1, 2]
gini = 0.0
samples = 43
value = [0, 0, 43]
gini = 0.0
samples = 47
value = [0, 47, 0]
gini = 0.0
samples = 1
value = [0, 0, 1]
gini = 0.0
samples = 3
value = [0, 0, 3]
x[0] <= 6.95
gini = 0.444
samples = 3
value = [0, 2, 1]
gini = 0.0
samples = 2
value = [0, 0, 2]
gini = 0.0
samples = 1
value = [0, 1, 0]
gini = 0.0
samples = 2
value = [0, 2, 0]
gini = 0.0
samples = 1
value = [0, 0, 1]