关于xgboost的一个小例子

问题描叙

如何根据已知的两个数据集的分布，自动确定边界划分标准，并且对测试集中的点进行分类。

python代码

'''python

-- coding=utf-8 --

import numpy as np import matplotlib.pyplot as plt import xgboost as xgb

train data

def get_train_data(data_size=100): data_label = np.zeros((2*data_size, 1)) # class 1 x1 = np.reshape(np.random.normal(3, 1, data_size), (data_size, 1)) y1 = np.reshape(np.random.normal(4, 1, data_size), (data_size, 1)) data_train = np.concatenate((x1, y1), axis=1) data_label[0:data_size, :] = 0 # class 2 x2 = np.reshape(np.random.normal(1, 1, data_size), (data_size, 1)) y2 = np.reshape(np.random.normal(0.5, 1, data_size), (data_size, 1)) data_train = np.concatenate((data_train, np.concatenate((x2, y2), axis=1)), axis=0) data_label[data_size:2*data_size, :] = 1

```
return data_train, data_label
```

test data

def get_test_data(start, end, data_size=100): data1 = (end - start) * np.random.random((data_size, 1)) + start data2 = (end - start) * np.random.random((data_size, 1)) + start data_test = np.concatenate((data1, data2), axis=1) return data_test

show data distribution

def plot_data(train_data, data_size, test_data): plt.figure() plt.plot(train_data[0:data_size, 0], train_data[0:data_size, 1], 'g.', train_data[data_size:2*data_size, 0], train_data[data_size:2*data_size, 1], 'b*', test_data[:, 0], test_data[:, 1], 'rs') plt.legend(['class1', 'class 2', 'test_data']) plt.title('Distribution') plt.grid(True) plt.xlabel('axis1') plt.ylabel('axis2') plt.show()

plot predict res

def plot_predict_data(train_data, data_size, test_data, predict_res1, predict_res2): plt.figure() plt.subplot(1, 2, 1) plt.plot(train_data[0:data_size, 0], train_data[0:data_size, 1], 'g.', train_data[data_size:2*data_size, 0], train_data[data_size:2*data_size, 1], 'b*', test_data[:, 0], test_data[:, 1], 'ms') plt.legend(['class1', 'class2', 'test_data']) plt.title('Distribution') plt.grid(True) plt.xlabel('axis1') plt.ylabel('axis2')

```
plt.subplot(1, 2, 2)
plt.plot(train_data[0:data_size, 0], train_data[0:data_size, 1], 'g.',
         train_data[data_size:2 * data_size, 0], train_data[data_size:2 * data_size, 1], 'b*',
         predict_res1[:, 0], predict_res1[:, 1], 'ro',
         predict_res2[:, 0], predict_res2[:, 1], 'rs')
plt.legend(['class1', 'class2', 'predict1', 'predict2'])
plt.title('Predict res')
plt.grid(True)
plt.xlabel('axis1')
plt.ylabel('axis2')
plt.show()
```

main function

if **name** == '**main**': data_size = 100 train_data0, label_data = get_train_data(data_size) # train data generate test_data0 = get_test_data(-1, 5, 10) # test data plot_data(train_data0, data_size, test_data0) # plot # data convert train_data = xgb.DMatrix(train_data0, label=label_data) test_data = xgb.DMatrix(test_data0)

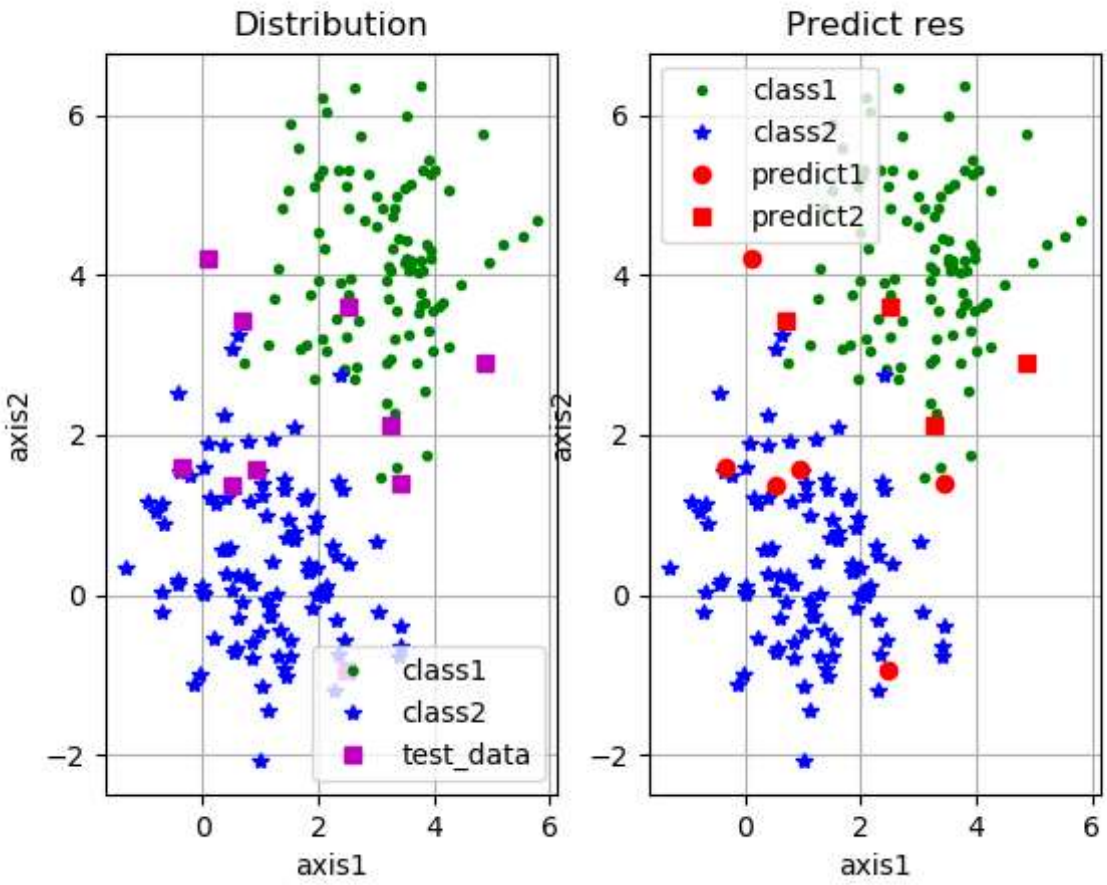
```
# data training
num_round = 50
param = {'booster': 'gbtree', 'eta': 0.1, 'max_depth': 5, 'objective': 'binary:logistic'}
bst = xgb.train(param, train_data, num_round)

# make prediction
predict_res = bst.predict(test_data)
print("predict_res")
index1 = predict_res > 0.5
res1 = test_data0[index1, :]
res2 = test_data0[~index1, :]

# plot prediction result
plot_predict_data(train_data0, data_size, test_data0, res1, res2)
```

'''

运行结果

原始数据与测试集

原始数据与测试集



运行结果----分类结果

参考文献

m_buddy的博客