Fáza 3 - strojové učenie

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V tejto fáze využijeme nami predspracované dáta z predošlej fázy na natrénovanie modelu, ktorý bude schopný robiť rozumné predikcie pre nové pozorovania pomocou strojového učenia.

In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import scipy.stats as stats
import numpy as np
import category_encoders as ce
from datetime import datetime
from sklearn.impute import SimpleImputer, KNNImputer
from copy import deepcopy
from scipy import mean
from sklearn import tree, metrics, svm
from sklearn.model_selection import cross_val_score
from sklearn.model_selection import GridSearchCV
from pprint import pprint
from sklearn.pipeline import Pipeline
from sklearn.base import TransformerMixin
from sklearn.compose import ColumnTransformer
from sklearn.preprocessing import PowerTransformer
from sklearn.feature_selection import SelectKBest
from sklearn.preprocessing import MinMaxScaler
from sklearn.feature_selection import mutual_info_regression

xtrain = pd.read_csv("data/X_train.csv", sep=',')
xtest = pd.read_csv("data/X_test.csv", sep=',')
ytrain = pd.read_csv("data/y_train.csv", sep=',')
ytest = pd.read_csv("data/y_test.csv", sep=',')


profiles = "data/profiles.csv"
dfp = pd.read_csv(profiles, sep='\t')

labor = "data/labor.csv"
dfl = pd.read_csv(labor, sep='\t')
```

Načítali sme si trénovacie a testovacie dáta.

In [2]:
```
xtrain.head()
```

Out[2]:

	hematokrit	hemoglobin	er-cv	erytrocyty	hbver
0	0.489452	0.781517	0.365514	0.493230	0.458152
1	0.632758	0.324983	0.464994	0.562196	0.680407
2	0.509218	0.604928	0.540910	0.470804	0.371400
3	0.613710	0.483566	0.588659	0.497569	0.347080
4	0.456906	0.723530	0.321346	0.477563	0.261482

In [3]:
```
ytrain.head()
```

Out[3]:

	indicator
0	1.0
1	0.0
2	0.0
3	0.0
4	0.0

Vytvoríme si zlúčený trénovací dataframe pre jednoduhšiu prácu pri OneR klasifikácii.

In [4]:
```
train_join = xtrain.join(ytrain)
train_join
```

Out[4]:

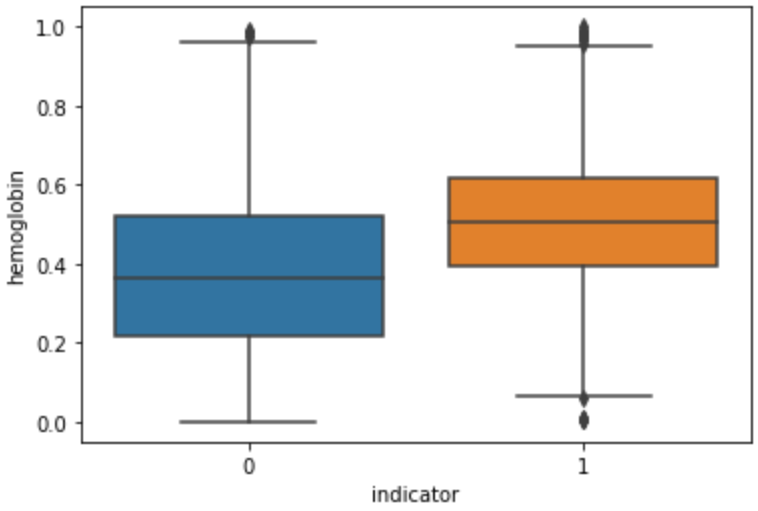
	hematokrit	hemoglobin	er-cv	erytrocyty	hbver	indicator
0	0.489452	0.781517	0.365514	0.493230	0.458152	1.0
1	0.632758	0.324983	0.464994	0.562196	0.680407	0.0
2	0.509218	0.604928	0.540910	0.470804	0.371400	0.0
3	0.613710	0.483566	0.588659	0.497569	0.347080	0.0
4	0.456906	0.723530	0.321346	0.477563	0.261482	0.0
...	...	...	...	...	...	...
7433	0.599123	0.666367	0.750780	0.116027	0.515945	1.0
7434	0.795075	0.003092	0.494317	0.229950	0.512240	0.0
7435	0.481418	0.620453	0.577534	0.300379	0.594770	1.0
7436	0.344020	0.363165	0.536503	0.393597	0.535648	1.0
7437	0.375136	0.442578	0.408227	0.519224	0.546454	1.0

7438 rows × 6 columns

Už vo fáze EDA sme videli výraznejšiu závislosť indikátora a hemoglobínu, taktiež indikátora a hematokritu. Tieto dva atribúty po predspracovaní rovnako skončili medzi najdôležitejšími ohľadom vplyvu na indikátor. Úplne manuálne by sa dali pravidlá stanoviť napríklad tak, že sa pozrieme na rozdielne mediány atribútu skupiny s indikátorom 0 v porovnaní s indikátorom 1.

In [5]:
```
xtrain0 = train_join[train_join['indicator']==0]
xtrain1 = train_join[train_join['indicator']==1]
sns.boxplot(data=[xtrain0['hemoglobin'], xtrain1['hemoglobin']]).set(xlabel='indicator', y
```

Out[5]:
```
[Text(0.5, 0, 'indicator'), Text(0, 0.5, 'hemoglobin')]
```



Napríklad pri hemoglobíne by sme mohli povedať, že by rozhodla hodnota v strede medzi priemermi skupín s indikátorom 0 a 1. Menšie hodnoty ako táto hranica by klasifikovali indikátor 0, naopak vyššie by znamenali indikátor 1. Táto hodnota je:

In [6]:
```
manual_value = np.mean([xtrain0['hemoglobin'].median(), xtrain1['hemoglobin'].median()])
manual_value
```

Out[6]:
```
0.43352734995825193
```

Spočítame si úspešnosť na trénovacom sete.

In [7]:
```
correct = 0
for i in range(len(train_join)):
    value = train_join.iloc[i]['hemoglobin']
    if train_join.iloc[i]['hemoglobin'] < manual_value:
        if ytrain.iloc[i]['indicator']==0:
            correct += 1
    else:
        if ytrain.iloc[i]['indicator']==1:
            correct += 1
correct/len(train_join)
```

Out[7]:
```
0.6466792148426996
```

Vidíme, že úspešnosť takto zvoleného pravidla sa blíži k dvom tretinám. Dá sa však zlepšiť.

Vytvoríme si dataframe, do ktorého si budeme ukladať informácie o klasifikačných algoritmoch pre účel ich porovnania.

In [8]:
```
algorithm_accuracy = pd.DataFrame(columns=['algorithm', 'hyperparameters', 'accuracy', 'pr
```

1. Manuálne vytvorenie a vyhodnotenie rozhodovacích pravidiel pre klasifikáciu

Definujeme si funkciu, ktorá vytvorí pravidlá pre OneR algoritmus.

- na vstupe očakáva dataframe s atribútmi a indikátorom, stĺpce, pre ktoré chceme vytvárať pravidlá a počet skupín
- podľa buckets sa dataframe rozdelí na skupiny, ktoré slúžia na diskretizáciu hodnôt
- body na hranici týchto buckets sú potenciálne body binárneho delenia na indikátor 0 a 1

- každý z týchto bodov sa skúma na úspešnosť klasifikácie záznamov menších a väčších ako daná hodnota
- najlepší bod rozdelenia so svojou úspešnosťou je vybratý ako pravidlo
- pravidlá sa ukladajú do svojho dataframe a nakoniec sú zoradené od najúspešnejšieho

In [9]:
```
def one_r_make_rules(data, cols, buckets):

    rules = pd.DataFrame(columns=['attribute', 'value', 'smaller', 'importance'])

    for attribute in cols:
        scores = pd.DataFrame(columns=['value', 'smaller', 'success'])
        data_sort = data[[attribute, 'indicator']].sort_values(by=attribute)

        for i, point in enumerate(np.arange(len(data_sort)//buckets, len(data_sort), len(d
            data_left = data_sort[:point]
            data_right = data_sort[point:]
            success = (len(data_left[data_left['indicator']==0]) + len(data_right[data_rig
            if success < 0.5:
                scores = scores.append({'value':data_sort.iloc[point][attribute], 'smaller
            else:
                scores = scores.append({'value':data_sort.iloc[point][attribute], 'smaller
        #print(scores)
        best = scores.sort_values(by='success', ascending=False).reset_index().loc[0]
        rules = rules.append({'attribute':attribute, 'value':best['value'], 'smaller':best

    rules = rules.sort_values(by='importance', ascending=False).reset_index()
    return rules
```

Funkcia na čitateľný výpis vytvorených pravidiel

- best = True vypíše len najlepšie pravidlo, False vypíše všetky

In [10]:
```
def one_r_print_rules(rules, best):
    if best:
        print('If', rules.iloc[0]['attribute'], 'is smaller than', rules.iloc[0]['value'],
    else:
        for i in range(len(rules)):
            print('If', rules.iloc[i]['attribute'], 'is smaller than', rules.iloc[i]['valu
```

Ďalej si definujeme funkciu, ktorá vykoná samotnú klasifikáciu, vracia dataframe s klasifikovanými hodnotami indikátora

In [11]:
```
def one_r_classify(data, rule):
    lo = rule['smaller']
    hi = 1.0 if lo == 0 else 0.0

    result = pd.DataFrame(columns=['indicator'])

    for i in range(len(data)):
        value = data.iloc[i][rule['attribute']]
        if value < rule['value']:
            result = result.append({'indicator':lo}, ignore_index=True)
        else:
            result = result.append({'indicator':hi}, ignore_index=True)
    return result
```

In [12]:
```
def count_positives_negatives(classified, train):
    tp = tn = fp = fn = 0
    for i in range(len(train)):
        a = train.iloc[i]['indicator']
```

```
        b = classified.iloc[i]['indicator']
        if a == b:
            if a == 0:
                tn += 1
            else:
                tp += 1

        else:
            if a == 0:
                fp += 1
            else:
                fn += 1

    return tp, tn, fp, fn
```

In [13]:
```
rules = one_r_make_rules(train_join, xtrain.columns, 50)
one_r_print_rules(rules, False)
```

```
If hemoglobin is smaller than 0.2838841865790894 : indicator = 0 importance: 0.7225060500134445

If hematokrit is smaller than 0.5895401015348607 : indicator = 1 importance: 0.6628125840279645

If erytrocyty is smaller than 0.8498849070929964 : indicator = 1 importance: 0.6472169938155419

If hbver is smaller than 0.8278276577878817 : indicator = 1 importance: 0.64425920946491

If er-cv is smaller than 0.9406695269801008 : indicator = 1 importance: 0.6437214304920678
```

Po skúšaní rôzneho počtu bucketov sme prišli na to, že 50 poskytuje dostatočne detailné "rozlíšenie" hraničnej hodnoty, možno by stačilo aj 10 alebo 15. Naopak 500 bucketov nemalo prakticky takmer žiadny efekt na úspešnosť pravidla (nárast o 0,1%).

Môžeme sa pozrieť na úspešnosť takéhoto klasifikátora na testovacom sete. Vidíme, že má veľmi podobnú úspešnosť:

In [14]:
```
ytest_classified = one_r_classify(xtest, rules.loc[0])
tp, tn, fp, fn = count_positives_negatives(ytest_classified, ytest)
```

In [15]:
```
print(f'No. of true positives: {tp}\nNo. of true negatives: {tn}\nNo. of false positives:
```

```
No. of true positives: 1486
No. of true negatives: 279
No. of false positives: 608
No. of false negatives: 107
```

Vyhodnotenie pomocou metriky accuracy (počet true positive + počet true negative / počet všetkých)

In [16]:
```
acc = metrics.accuracy_score(ytest, ytest_classified)
print('Accuracy :', acc * 100, '%')
```

```
Accuracy : 71.16935483870968 %
```

Vyhodnotenie pomocou metriky precision (počet true positive / (počet true positives + počet false positives))

In [17]:
```
prec = metrics.precision_score(ytest, ytest_classified)
```

```
print('Precision :', prec * 100, '%')
```

```
Precision : 70.96466093600765 %
```

Vyhodnotenie pomocou metriky recall (počet true positives / (počet true positives + počet false negatives))

In [18]:
```
rec = metrics.recall_score(ytest, ytest_classified)
print('Recall :', rec * 100, '%')
```

```
Recall : 93.28311362209666 %
```

In [19]:
```
algorithm_accuracy = algorithm_accuracy.append({'algorithm':'oneR', 'accuracy':acc, 'preci
```

Na základe vyhodnotení môžeme povedať, že nami vytvorený klasifikátor dosahuje dobrú úspešnosť.

2. Natrénovanie a vyhodnotenie klasifikátora strojového učenia

V tejto časti sme zvolili použiť Decision Tree klasifikátor z knižnice sklearn.

Najskôr si natrénujeme klasifikátor na naše trénovacie dáta.

In [20]:
```
clf0 = tree.DecisionTreeClassifier()
clf0 = clf0.fit(xtrain, ytrain)
plt.figure(figsize=(15,8))
tree.plot_tree(clf0)
```

Out[20]:
```
[Text(193.36612683317136, 425.82, 'X[1] <= 0.287\ngini = 0.458\nsamples = 7438\nvalue = [2
636, 4802]'),
 Text(46.46326094376086, 407.7, 'X[0] <= 0.439\ngini = 0.409\nsamples = 1370\nvalue = [97
8, 392]'),
 Text(17.303322577213574, 389.58, 'X[3] <= 0.391\ngini = 0.168\nsamples = 194\nvalue = [1
8, 176]'),
 Text(11.812559838303606, 371.46, 'X[0] <= 0.417\ngini = 0.122\nsamples = 184\nvalue = [1
2, 172]'),
 Text(5.5798021346760756, 353.34, 'X[4] <= 0.309\ngini = 0.071\nsamples = 162\nvalue = [6,
156]'),
 Text(1.8995071096769618, 335.21999999999997, 'X[0] <= 0.286\ngini = 0.48\nsamples = 5\nva
lue = [2, 3]'),
 Text(0.9497535548384809, 317.1, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(2.849260664515443, 317.1, 'X[1] <= 0.242\ngini = 0.444\nsamples = 3\nvalue = [2,
1]'),
 Text(1.8995071096769618, 298.98, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(3.7990142193539236, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(9.260097159675189, 335.21999999999997, 'X[2] <= 0.035\ngini = 0.05\nsamples = 157\nv
alue = [4, 153]'),
 Text(6.648274883869366, 317.1, 'X[0] <= 0.366\ngini = 0.5\nsamples = 2\nvalue = [1, 1]'),
 Text(5.698521329030886, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(7.598028438707847, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(11.871919435481011, 317.1, 'X[4] <= 0.363\ngini = 0.038\nsamples = 155\nvalue = [3,
152]'),
 Text(9.497535548384809, 298.98, 'X[4] <= 0.36\ngini = 0.219\nsamples = 8\nvalue = [1,
7]'),
 Text(8.547781993546328, 280.86, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(10.447289103223289, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(14.246303322577214, 298.98, 'X[4] <= 0.627\ngini = 0.027\nsamples = 147\nvalue = [2,
145]'),
 Text(12.346796212900252, 280.86, 'X[2] <= 0.715\ngini = 0.015\nsamples = 136\nvalue = [1,
135]'),
 Text(11.397042658061771, 262.74, 'gini = 0.0\nsamples = 124\nvalue = [0, 124]'),
 Text(13.296549767738732, 262.74, 'X[2] <= 0.716\ngini = 0.153\nsamples = 12\nvalue = [1,
11]'),
 Text(12.346796212900252, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
```

```
 Text(14.246303322577214, 244.61999999999998, 'gini = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
 Text(16.145810432254176, 280.86, 'X[4] <= 0.628\ngini = 0.165\nsamples = 11\nvalue = [1,
10]'),
 Text(15.196056877415694, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(17.095563987092657, 262.74, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(18.045317541931137, 353.34, 'X[4] <= 0.475\ngini = 0.397\nsamples = 22\nvalue = [6,
16]'),
 Text(17.095563987092657, 335.21999999999997, 'X[4] <= 0.344\ngini = 0.48\nsamples = 15\nv
alue = [6, 9]'),
 Text(16.145810432254176, 317.1, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(18.045317541931137, 317.1, 'X[3] <= 0.112\ngini = 0.496\nsamples = 11\nvalue = [6,
5]'),
 Text(17.095563987092657, 298.98, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(18.995071096769617, 298.98, 'X[2] <= 0.238\ngini = 0.444\nsamples = 9\nvalue = [6,
3]'),
 Text(18.045317541931137, 280.86, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(19.944824651608098, 280.86, 'X[2] <= 0.689\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(18.995071096769617, 262.74, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(20.894578206446578, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(18.995071096769617, 335.21999999999997, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(22.794085316123542, 371.46, 'X[4] <= 0.532\ngini = 0.48\nsamples = 10\nvalue = [6,
4]'),
 Text(21.844331761285062, 353.34, 'X[0] <= 0.333\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(20.894578206446578, 335.21999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(22.794085316123542, 335.21999999999997, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(23.743838870962023, 353.34, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(75.62319931030814, 389.58, 'X[1] <= 0.206\ngini = 0.3\nsamples = 1176\nvalue = [960,
216]'),
 Text(40.67430897840502, 371.46, 'X[0] <= 0.528\ngini = 0.179\nsamples = 675\nvalue = [60
8, 67]'),
 Text(27.067976312896704, 353.34, 'X[4] <= 0.499\ngini = 0.465\nsamples = 49\nvalue = [31,
18]'),
 Text(24.693592425800503, 335.21999999999997, 'X[3] <= 0.157\ngini = 0.257\nsamples = 33\n
value = [28, 5]'),
 Text(22.794085316123542, 317.1, 'X[1] <= 0.142\ngini = 0.32\nsamples = 5\nvalue = [1,
4]'),
 Text(21.844331761285062, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(23.743838870962023, 298.98, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(26.593099535477464, 317.1, 'X[2] <= 0.174\ngini = 0.069\nsamples = 28\nvalue = [27,
1]'),
 Text(25.643345980638983, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(27.542853090315948, 298.98, 'gini = 0.0\nsamples = 27\nvalue = [27, 0]'),
 Text(29.44236019999291, 335.21999999999997, 'X[3] <= 0.413\ngini = 0.305\nsamples = 16\nv
alue = [3, 13]'),
 Text(28.492606645154428, 317.1, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(30.39211375483139, 317.1, 'X[3] <= 0.815\ngini = 0.375\nsamples = 4\nvalue = [3,
1]'),
 Text(29.44236019999291, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(31.34186730966987, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(54.280641643913334, 353.34, 'X[0] <= 0.837\ngini = 0.144\nsamples = 626\nvalue = [57
7, 49]'),
 Text(46.08530725860785, 335.21999999999997, 'X[4] <= 0.804\ngini = 0.109\nsamples = 569\n
value = [536, 33]'),
 Text(40.85424275734903, 317.1, 'X[4] <= 0.67\ngini = 0.095\nsamples = 561\nvalue = [533,
28]'),
 Text(33.24137441934683, 298.98, 'X[0] <= 0.805\ngini = 0.051\nsamples = 458\nvalue = [44
6, 12]'),
 Text(26.80085812559838, 280.86, 'X[3] <= 0.148\ngini = 0.04\nsamples = 437\nvalue = [428,
9]'),
 Text(23.061203503421865, 262.74, 'X[1] <= 0.165\ngini = 0.236\nsamples = 22\nvalue = [19,
3]'),
 Text(22.111449948583385, 244.61999999999998, 'gini = 0.0\nsamples = 15\nvalue = [15,
0]'),
```

```
 Text(24.010957058260345, 244.61999999999998, 'X[1] <= 0.169\ngini = 0.49\nsamples = 7\nva
lue = [4, 3]'),
 Text(23.061203503421865, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(24.960710613098826, 226.49999999999997, 'X[1] <= 0.2\ngini = 0.32\nsamples = 5\nvalu
e = [4, 1]'),
 Text(24.010957058260345, 208.38, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(25.910464167937306, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(30.5405127477749, 262.74, 'X[4] <= 0.207\ngini = 0.028\nsamples = 415\nvalue = [409,
6]'),
 Text(27.80997127761427, 244.61999999999998, 'X[1] <= 0.12\ngini = 0.375\nsamples = 4\nval
ue = [3, 1]'),
 Text(26.860217722775786, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(28.75972483245275, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(33.271054217935536, 244.61999999999998, 'X[1] <= 0.204\ngini = 0.024\nsamples = 411
\nvalue = [406, 5]'),
 Text(30.65923194212971, 226.49999999999997, 'X[2] <= 0.722\ngini = 0.02\nsamples = 405\nv
alue = [401, 4]'),
 Text(28.28484805503351, 208.38, 'X[3] <= 0.214\ngini = 0.011\nsamples = 347\nvalue = [34
5, 2]'),
 Text(26.385340945356546, 190.26, 'X[3] <= 0.206\ngini = 0.062\nsamples = 31\nvalue = [30,
1]'),
 Text(25.435587390518066, 172.14, 'gini = 0.0\nsamples = 30\nvalue = [30, 0]'),
 Text(27.335094500195027, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(30.18435516471047, 190.26, 'X[4] <= 0.608\ngini = 0.006\nsamples = 316\nvalue = [31
5, 1]'),
 Text(29.23460160987199, 172.14, 'gini = 0.0\nsamples = 222\nvalue = [222, 0]'),
 Text(31.13410871954895, 172.14, 'X[4] <= 0.609\ngini = 0.021\nsamples = 94\nvalue = [93,
1]'),
 Text(30.18435516471047, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(32.083862274387435, 154.01999999999998, 'gini = 0.0\nsamples = 93\nvalue = [93,
0]'),
 Text(33.033615829225916, 208.38, 'X[2] <= 0.725\ngini = 0.067\nsamples = 58\nvalue = [56,
2]'),
 Text(32.083862274387435, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(33.983369384064396, 190.26, 'X[4] <= 0.634\ngini = 0.034\nsamples = 57\nvalue = [56,
1]'),
 Text(33.033615829225916, 172.14, 'gini = 0.0\nsamples = 44\nvalue = [44, 0]'),
 Text(34.933122938902876, 172.14, 'X[4] <= 0.638\ngini = 0.142\nsamples = 13\nvalue = [12,
1]'),
 Text(33.983369384064396, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(35.88287649374136, 154.01999999999998, 'gini = 0.0\nsamples = 12\nvalue = [12, 0]'),
 Text(35.88287649374136, 226.49999999999997, 'X[0] <= 0.717\ngini = 0.278\nsamples = 6\nva
lue = [5, 1]'),
 Text(34.933122938902876, 208.38, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(36.83263004857984, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(39.68189071309528, 280.86, 'X[0] <= 0.806\ngini = 0.245\nsamples = 21\nvalue = [18,
3]'),
 Text(38.7321371582568, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(40.63164426793376, 262.74, 'X[1] <= 0.156\ngini = 0.18\nsamples = 20\nvalue = [18,
2]'),
 Text(38.7321371582568, 244.61999999999998, 'X[3] <= 0.507\ngini = 0.105\nsamples = 18\nva
lue = [17, 1]'),
 Text(37.78238360341832, 226.49999999999997, 'gini = 0.0\nsamples = 11\nvalue = [11, 0]'),
 Text(39.68189071309528, 226.49999999999997, 'X[3] <= 0.542\ngini = 0.245\nsamples = 7\nva
lue = [6, 1]'),
 Text(38.7321371582568, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(40.63164426793376, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(42.53115137761072, 244.61999999999998, 'X[0] <= 0.813\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(41.58139782277224, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(43.48090493244921, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(48.46711109535123, 298.98, 'X[3] <= 0.595\ngini = 0.262\nsamples = 103\nvalue = [87,
16]'),
 Text(44.43065848728769, 280.86, 'X[1] <= 0.129\ngini = 0.473\nsamples = 13\nvalue = [5,
8]'),
 Text(43.48090493244921, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
```

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 Text(45.38041204212617, 262.74, 'X[3] <= 0.425\ngini = 0.397\nsamples = 11\nvalue = [3,
8]'),
 Text(44.43065848728769, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(46.33016559696465, 244.61999999999998, 'X[4] <= 0.791\ngini = 0.198\nsamples = 9\nva
lue = [1, 8]'),
 Text(45.38041204212617, 226.49999999999997, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(47.27991915180313, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(52.50356370341477, 280.86, 'X[1] <= 0.161\ngini = 0.162\nsamples = 90\nvalue = [82,
8]'),
 Text(49.17942626148009, 262.74, 'X[3] <= 0.634\ngini = 0.088\nsamples = 65\nvalue = [62,
3]'),
 Text(48.22967270664161, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(50.12917981631857, 244.61999999999998, 'X[3] <= 0.705\ngini = 0.061\nsamples = 64\nv
alue = [62, 2]'),
 Text(49.17942626148009, 226.49999999999997, 'X[2] <= 0.572\ngini = 0.32\nsamples = 10\nva
lue = [8, 2]'),
 Text(48.22967270664161, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(50.12917981631857, 208.38, 'X[2] <= 0.746\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(49.17942626148009, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(51.07893337115705, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(51.07893337115705, 226.49999999999997, 'gini = 0.0\nsamples = 54\nvalue = [54, 0]'),
 Text(55.82770114534946, 262.74, 'X[1] <= 0.178\ngini = 0.32\nsamples = 25\nvalue = [20,
5]'),
 Text(53.92819403567249, 244.61999999999998, 'X[4] <= 0.734\ngini = 0.494\nsamples = 9\nva
lue = [5, 4]'),
 Text(52.97844048083401, 226.49999999999997, 'X[1] <= 0.163\ngini = 0.278\nsamples = 6\nva
lue = [5, 1]'),
 Text(52.02868692599553, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(53.92819403567249, 208.38, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(54.87794759051098, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(57.72720825502642, 244.61999999999998, 'X[0] <= 0.658\ngini = 0.117\nsamples = 16\nv
alue = [15, 1]'),
 Text(56.77745470018794, 226.49999999999997, 'X[4] <= 0.694\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(55.82770114534946, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(57.72720825502642, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(58.6769618098649, 226.49999999999997, 'gini = 0.0\nsamples = 14\nvalue = [14, 0]'),
 Text(51.31637175986667, 317.1, 'X[0] <= 0.757\ngini = 0.469\nsamples = 8\nvalue = [3,
5]'),
 Text(50.36661820502819, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(52.26612531470515, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(62.47597602921882, 335.21999999999997, 'X[2] <= 0.458\ngini = 0.404\nsamples = 57\nv
alue = [41, 16]'),
 Text(60.57646891954186, 317.1, 'X[4] <= 0.704\ngini = 0.499\nsamples = 19\nvalue = [9, 1
0]'),
 Text(59.62671536470338, 298.98, 'X[3] <= 0.466\ngini = 0.408\nsamples = 14\nvalue = [4, 1
0]'),
 Text(58.6769618098649, 280.86, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(60.57646891954186, 280.86, 'X[2] <= 0.282\ngini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(59.62671536470338, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(61.52622247438034, 262.74, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(61.52622247438034, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(64.37548313889579, 317.1, 'X[1] <= 0.197\ngini = 0.266\nsamples = 38\nvalue = [32,
6]'),
 Text(63.4257295840573, 298.98, 'X[0] <= 0.84\ngini = 0.234\nsamples = 37\nvalue = [32,
5]'),
 Text(62.47597602921882, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(64.37548313889579, 280.86, 'X[2] <= 0.88\ngini = 0.198\nsamples = 36\nvalue = [32,
4]'),
 Text(63.4257295840573, 262.74, 'X[1] <= 0.149\ngini = 0.157\nsamples = 35\nvalue = [32,
3]'),
 Text(61.52622247438034, 244.61999999999998, 'X[1] <= 0.009\ngini = 0.067\nsamples = 29\nv
alue = [28, 1]'),
 Text(60.57646891954186, 226.49999999999997, 'X[2] <= 0.511\ngini = 0.444\nsamples = 3\nva
```

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lue = [2, 1]'),
 Text(59.62671536470338, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(61.52622247438034, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(62.47597602921882, 226.49999999999997, 'gini = 0.0\nsamples = 26\nvalue = [26, 0]'),
 Text(65.32523669373427, 244.61999999999998, 'X[1] <= 0.174\ngini = 0.444\nsamples = 6\nva
lue = [4, 2]'),
 Text(64.37548313889579, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(66.27499024857275, 226.49999999999997, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(65.32523669373427, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(65.32523669373427, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(110.57208964221127, 371.46, 'X[4] <= 0.644\ngini = 0.418\nsamples = 501\nvalue = [35
2, 149]'),
 Text(96.57806460763803, 353.34, 'X[0] <= 0.698\ngini = 0.333\nsamples = 355\nvalue = [28
0, 75]'),
 Text(84.6171057763909, 335.21999999999997, 'X[0] <= 0.508\ngini = 0.252\nsamples = 284\nv
alue = [242, 42]'),
 Text(74.82277224211907, 317.1, 'X[3] <= 0.321\ngini = 0.468\nsamples = 75\nvalue = [47, 2
8]'),
 Text(70.07400446792667, 298.98, 'X[1] <= 0.237\ngini = 0.476\nsamples = 41\nvalue = [16,
25]'),
 Text(68.17449735824971, 280.86, 'X[4] <= 0.293\ngini = 0.219\nsamples = 16\nvalue = [2, 1
4]'),
 Text(67.22474380341123, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(69.12425091308819, 262.74, 'X[3] <= 0.239\ngini = 0.124\nsamples = 15\nvalue = [1, 1
4]'),
 Text(68.17449735824971, 244.61999999999998, 'gini = 0.0\nsamples = 11\nvalue = [0, 11]'),
 Text(70.07400446792667, 244.61999999999998, 'X[0] <= 0.483\ngini = 0.375\nsamples = 4\nva
lue = [1, 3]'),
 Text(69.12425091308819, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(71.02375802276515, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(71.97351157760363, 280.86, 'X[3] <= 0.175\ngini = 0.493\nsamples = 25\nvalue = [14,
11]'),
 Text(71.02375802276515, 262.74, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(72.92326513244211, 262.74, 'X[2] <= 0.354\ngini = 0.475\nsamples = 18\nvalue = [7, 1
1]'),
 Text(71.97351157760363, 244.61999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(73.87301868728059, 244.61999999999998, 'X[1] <= 0.244\ngini = 0.391\nsamples = 15\nv
alue = [4, 11]'),
 Text(72.92326513244211, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(74.82277224211907, 226.49999999999997, 'X[2] <= 0.606\ngini = 0.337\nsamples = 14\nv
alue = [3, 11]'),
 Text(73.87301868728059, 208.38, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(75.77252579695755, 208.38, 'X[0] <= 0.469\ngini = 0.5\nsamples = 6\nvalue = [3,
3]'),
 Text(74.82277224211907, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(76.72227935179603, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(79.57154001631147, 298.98, 'X[2] <= 0.836\ngini = 0.161\nsamples = 34\nvalue = [31,
3]'),
 Text(78.621786461473, 280.86, 'X[4] <= 0.383\ngini = 0.114\nsamples = 33\nvalue = [31,
2]'),
 Text(76.72227935179603, 262.74, 'X[1] <= 0.257\ngini = 0.5\nsamples = 2\nvalue = [1,
1]'),
 Text(75.77252579695755, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(77.67203290663451, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(80.52129357114995, 262.74, 'X[4] <= 0.588\ngini = 0.062\nsamples = 31\nvalue = [30,
1]'),
 Text(79.57154001631147, 244.61999999999998, 'gini = 0.0\nsamples = 28\nvalue = [28, 0]'),
 Text(81.47104712598843, 244.61999999999998, 'X[2] <= 0.594\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(80.52129357114995, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(82.42080068082691, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(80.52129357114995, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(94.41143931066274, 317.1, 'X[1] <= 0.287\ngini = 0.125\nsamples = 209\nvalue = [195,
14]'),
 Text(93.46168575582426, 298.98, 'X[4] <= 0.521\ngini = 0.117\nsamples = 208\nvalue = [19
5, 13]'),
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 Text(89.78139073082515, 280.86, 'X[4] <= 0.519\ngini = 0.214\nsamples = 82\nvalue = [72,
10]'),
 Text(88.83163717598667, 262.74, 'X[4] <= 0.419\ngini = 0.198\nsamples = 81\nvalue = [72,
9]'),
 Text(85.27006134534237, 244.61999999999998, 'X[1] <= 0.231\ngini = 0.091\nsamples = 42\nv
alue = [40, 2]'),
 Text(84.32030779050388, 226.49999999999997, 'X[1] <= 0.225\ngini = 0.444\nsamples = 6\nva
lue = [4, 2]'),
 Text(83.3705542356654, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(85.27006134534237, 208.38, 'X[0] <= 0.67\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(84.32030779050388, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(86.21981490018085, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(86.21981490018085, 226.49999999999997, 'gini = 0.0\nsamples = 36\nvalue = [36, 0]'),
 Text(92.39321300663097, 244.61999999999998, 'X[3] <= 0.336\ngini = 0.295\nsamples = 39\nv
alue = [32, 7]'),
 Text(91.44345945179249, 226.49999999999997, 'X[4] <= 0.423\ngini = 0.234\nsamples = 37\nv
alue = [32, 5]'),
 Text(89.06907556469629, 208.38, 'X[2] <= 0.393\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(88.11932200985781, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(90.01882911953477, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(93.8178433388887, 208.38, 'X[2] <= 0.628\ngini = 0.161\nsamples = 34\nvalue = [31,
3]'),
 Text(91.91833622921173, 190.26, 'X[4] <= 0.443\ngini = 0.074\nsamples = 26\nvalue = [25,
1]'),
 Text(90.96858267437325, 172.14, 'X[4] <= 0.439\ngini = 0.278\nsamples = 6\nvalue = [5,
1]'),
 Text(90.01882911953477, 154.01999999999998, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(91.91833622921173, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(92.86808978405021, 172.14, 'gini = 0.0\nsamples = 20\nvalue = [20, 0]'),
 Text(95.71735044856565, 190.26, 'X[3] <= 0.293\ngini = 0.375\nsamples = 8\nvalue = [6,
2]'),
 Text(94.76759689372717, 172.14, 'X[2] <= 0.648\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(93.8178433388887, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(95.71735044856565, 154.01999999999998, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(96.66710400340413, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(93.34296656146945, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(90.73114428566363, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(97.14198078082337, 280.86, 'X[0] <= 0.668\ngini = 0.046\nsamples = 126\nvalue = [12
3, 3]'),
 Text(95.24247367114641, 262.74, 'X[3] <= 0.615\ngini = 0.017\nsamples = 114\nvalue = [11
3, 1]'),
 Text(94.29272011630793, 244.61999999999998, 'gini = 0.0\nsamples = 96\nvalue = [96, 0]'),
 Text(96.1922272259849, 244.61999999999998, 'X[3] <= 0.628\ngini = 0.105\nsamples = 18\nva
lue = [17, 1]'),
 Text(95.24247367114641, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(97.14198078082337, 226.49999999999997, 'gini = 0.0\nsamples = 17\nvalue = [17, 0]'),
 Text(99.04148789050033, 262.74, 'X[1] <= 0.265\ngini = 0.278\nsamples = 12\nvalue = [10,
2]'),
 Text(98.09173433566185, 244.61999999999998, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(99.99124144533882, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(95.36119286550122, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(108.53902343888514, 335.21999999999997, 'X[4] <= 0.517\ngini = 0.498\nsamples = 71\n
value = [38, 33]'),
 Text(106.63951632920818, 317.1, 'X[0] <= 0.969\ngini = 0.184\nsamples = 39\nvalue = [35,
4]'),
 Text(105.6897627743697, 298.98, 'X[3] <= 0.637\ngini = 0.145\nsamples = 38\nvalue = [35,
3]'),
 Text(103.79025566469274, 280.86, 'X[1] <= 0.209\ngini = 0.059\nsamples = 33\nvalue = [32,
1]'),
 Text(102.84050210985426, 262.74, 'X[0] <= 0.868\ngini = 0.5\nsamples = 2\nvalue = [1,
1]'),
 Text(101.89074855501578, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(103.79025566469274, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
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 Text(104.74000921953122, 262.74, 'gini = 0.0\nsamples = 31\nvalue = [31, 0]'),
 Text(107.58926988404666, 280.86, 'X[2] <= 0.662\ngini = 0.48\nsamples = 5\nvalue = [3,
2]'),
 Text(106.63951632920818, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(108.53902343888514, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(107.58926988404666, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(110.43853054856211, 317.1, 'X[3] <= 0.295\ngini = 0.17\nsamples = 32\nvalue = [3, 2
9]'),
 Text(109.48877699372363, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(111.3882841034006, 298.98, 'gini = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(124.56611467678451, 353.34, 'X[3] <= 0.603\ngini = 0.5\nsamples = 146\nvalue = [72,
74]'),
 Text(117.79912059856034, 335.21999999999997, 'X[0] <= 0.687\ngini = 0.412\nsamples = 62\n
value = [18, 44]'),
 Text(114.23754476791603, 317.1, 'X[4] <= 0.67\ngini = 0.114\nsamples = 33\nvalue = [2, 3
1]'),
 Text(113.28779121307755, 298.98, 'X[0] <= 0.662\ngini = 0.48\nsamples = 5\nvalue = [2,
3]'),
 Text(112.33803765823907, 280.86, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(114.23754476791603, 280.86, 'X[0] <= 0.676\ngini = 0.444\nsamples = 3\nvalue = [2,
1]'),
 Text(113.28779121307755, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(115.18729832275451, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(115.18729832275451, 298.98, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(121.36069642920464, 317.1, 'X[2] <= 0.398\ngini = 0.495\nsamples = 29\nvalue = [16,
13]'),
 Text(118.98631254210844, 298.98, 'X[0] <= 0.8\ngini = 0.32\nsamples = 10\nvalue = [2,
8]'),
 Text(118.03655898726996, 280.86, 'X[2] <= 0.163\ngini = 0.198\nsamples = 9\nvalue = [1,
8]'),
 Text(117.08680543243148, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(118.98631254210844, 262.74, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(119.93606609694692, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(123.73508031630084, 298.98, 'X[4] <= 0.682\ngini = 0.388\nsamples = 19\nvalue = [14,
5]'),
 Text(121.83557320662388, 280.86, 'X[0] <= 0.761\ngini = 0.5\nsamples = 8\nvalue = [4,
4]'),
 Text(120.8858196517854, 262.74, 'X[4] <= 0.655\ngini = 0.32\nsamples = 5\nvalue = [4,
1]'),
 Text(119.93606609694692, 244.61999999999998, 'X[1] <= 0.23\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(118.98631254210844, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(120.8858196517854, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(121.83557320662388, 244.61999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(122.78532676146236, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(125.6345874259778, 280.86, 'X[2] <= 0.762\ngini = 0.165\nsamples = 11\nvalue = [10,
1]'),
 Text(124.68483387113932, 262.74, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(126.58434098081628, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(131.33310875500868, 335.21999999999997, 'X[0] <= 0.825\ngini = 0.459\nsamples = 84\n
value = [54, 30]'),
 Text(130.3833552001702, 317.1, 'X[4] <= 0.856\ngini = 0.444\nsamples = 81\nvalue = [54, 2
7]'),
 Text(128.48384809049324, 298.98, 'X[0] <= 0.586\ngini = 0.429\nsamples = 77\nvalue = [53,
24]'),
 Text(127.53409453565476, 280.86, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(129.43360164533172, 280.86, 'X[4] <= 0.811\ngini = 0.448\nsamples = 71\nvalue = [47,
24]'),
 Text(128.48384809049324, 262.74, 'X[1] <= 0.273\ngini = 0.466\nsamples = 65\nvalue = [41,
24]'),
 Text(123.97251870501046, 244.61999999999998, 'X[2] <= 0.342\ngini = 0.431\nsamples = 54\n
value = [37, 17]'),
 Text(123.02276515017198, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(124.92227225984894, 226.49999999999997, 'X[2] <= 0.489\ngini = 0.47\nsamples = 45\nv
alue = [28, 17]'),
 Text(120.64838126307578, 208.38, 'X[4] <= 0.676\ngini = 0.473\nsamples = 13\nvalue = [5,
```

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8]'),
 Text(119.6986277082373, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(121.59813481791426, 190.26, 'X[4] <= 0.727\ngini = 0.397\nsamples = 11\nvalue = [3,
8]'),
 Text(120.64838126307578, 172.14, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(122.54788837275274, 172.14, 'X[2] <= 0.456\ngini = 0.5\nsamples = 6\nvalue = [3,
3]'),
 Text(121.59813481791426, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(123.49764192759122, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(129.1961632566221, 208.38, 'X[3] <= 0.925\ngini = 0.404\nsamples = 32\nvalue = [23,
9]'),
 Text(128.24640970178362, 190.26, 'X[3] <= 0.792\ngini = 0.358\nsamples = 30\nvalue = [23,
7]'),
 Text(127.29665614694514, 172.14, 'X[3] <= 0.75\ngini = 0.423\nsamples = 23\nvalue = [16,
7]'),
 Text(125.39714903726818, 154.01999999999998, 'X[0] <= 0.702\ngini = 0.291\nsamples = 17\n
value = [14, 3]'),
 Text(124.4473954824297, 135.89999999999998, 'X[4] <= 0.718\ngini = 0.42\nsamples = 10\nva
lue = [7, 3]'),
 Text(123.49764192759122, 117.77999999999997, 'X[0] <= 0.695\ngini = 0.219\nsamples = 8\nv
alue = [7, 1]'),
 Text(122.54788837275274, 99.65999999999997, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(124.4473954824297, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(125.39714903726818, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(126.34690259210666, 135.89999999999998, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(129.1961632566221, 154.01999999999998, 'X[1] <= 0.223\ngini = 0.444\nsamples = 6\nva
lue = [2, 4]'),
 Text(128.24640970178362, 135.89999999999998, 'X[4] <= 0.731\ngini = 0.444\nsamples = 3\nv
alue = [2, 1]'),
 Text(127.29665614694514, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(129.1961632566221, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(130.14591681146058, 135.89999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(129.1961632566221, 172.14, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(130.14591681146058, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(132.99517747597602, 244.61999999999998, 'X[4] <= 0.732\ngini = 0.463\nsamples = 11\n
value = [4, 7]'),
 Text(132.04542392113754, 226.49999999999997, 'X[3] <= 0.619\ngini = 0.219\nsamples = 8\nv
alue = [1, 7]'),
 Text(131.09567036629906, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(132.99517747597602, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(133.9449310308145, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(130.3833552001702, 262.74, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(132.28286230984716, 298.98, 'X[0] <= 0.46\ngini = 0.375\nsamples = 4\nvalue = [1,
3]'),
 Text(131.33310875500868, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(133.23261586468564, 280.86, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(132.28286230984716, 317.1, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(340.26899272258186, 407.7, 'X[0] <= 0.405\ngini = 0.397\nsamples = 6068\nvalue = [16
58, 4410]'),
 Text(174.17775300521257, 389.58, 'X[3] <= 0.193\ngini = 0.189\nsamples = 1996\nvalue = [2
11, 1785]'),
 Text(139.40601397113576, 371.46, 'X[1] <= 0.634\ngini = 0.427\nsamples = 55\nvalue = [38,
17]'),
 Text(137.03163008403956, 353.34, 'X[4] <= 0.356\ngini = 0.273\nsamples = 43\nvalue = [36,
7]'),
 Text(135.1321229743626, 335.21999999999997, 'X[0] <= 0.289\ngini = 0.408\nsamples = 7\nva
lue = [2, 5]'),
 Text(134.18236941952412, 317.1, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(136.08187652920108, 317.1, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(138.93113719371652, 335.21999999999997, 'X[4] <= 0.468\ngini = 0.105\nsamples = 36\n
value = [34, 2]'),
 Text(137.98138363887804, 317.1, 'gini = 0.0\nsamples = 26\nvalue = [26, 0]'),
 Text(139.880890748555, 317.1, 'X[1] <= 0.555\ngini = 0.32\nsamples = 10\nvalue = [8,
2]'),
 Text(138.93113719371652, 298.98, 'X[4] <= 0.484\ngini = 0.198\nsamples = 9\nvalue = [8,
1]'),
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 Text(137.98138363887804, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(139.880890748555, 280.86, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(140.83064430339348, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(141.78039785823196, 353.34, 'X[3] <= 0.186\ngini = 0.278\nsamples = 12\nvalue = [2,
 10]'),
 Text(140.83064430339348, 335.21999999999997, 'gini = 0.0\nsamples = 10\nvalue = [0, 1
0]'),
 Text(142.73015141307044, 335.21999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(208.9494920392894, 371.46, 'X[4] <= 0.374\ngini = 0.162\nsamples = 1941\nvalue = [17
3, 1768]'),
 Text(172.41736995142017, 353.34, 'X[0] <= 0.3\ngini = 0.093\nsamples = 1209\nvalue = [59,
 1150]'),
 Text(154.51303145278536, 335.21999999999997, 'X[3] <= 0.97\ngini = 0.048\nsamples = 572\n
value = [14, 558]'),
 Text(150.2688202546009, 317.1, 'X[1] <= 0.759\ngini = 0.045\nsamples = 570\nvalue = [13,
 557]'),
 Text(144.6296585227474, 298.98, 'X[4] <= 0.089\ngini = 0.025\nsamples = 480\nvalue = [6,
 474]'),
 Text(141.78039785823196, 280.86, 'X[0] <= 0.232\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(140.83064430339348, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(142.73015141307044, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(147.47891918726287, 280.86, 'X[0] <= 0.124\ngini = 0.021\nsamples = 477\nvalue = [5,
 472]'),
 Text(144.6296585227474, 262.74, 'X[0] <= 0.115\ngini = 0.159\nsamples = 23\nvalue = [2, 2
1]'),
 Text(143.67990496790893, 244.61999999999998, 'gini = 0.0\nsamples = 20\nvalue = [0, 2
0]'),
 Text(145.57941207758589, 244.61999999999998, 'X[1] <= 0.673\ngini = 0.444\nsamples = 3\nv
alue = [2, 1]'),
 Text(144.6296585227474, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(146.5291656324244, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(150.32817985177832, 262.74, 'X[3] <= 0.496\ngini = 0.013\nsamples = 454\nvalue = [3,
 451]'),
 Text(149.37842629693984, 244.61999999999998, 'X[3] <= 0.496\ngini = 0.037\nsamples = 161
\nvalue = [3, 158]'),
 Text(148.42867274210136, 226.49999999999997, 'X[1] <= 0.591\ngini = 0.025\nsamples = 160
\nvalue = [2, 158]'),
 Text(146.5291656324244, 208.38, 'X[4] <= 0.354\ngini = 0.013\nsamples = 155\nvalue = [1,
 154]'),
 Text(145.57941207758589, 190.26, 'gini = 0.0\nsamples = 138\nvalue = [0, 138]'),
 Text(147.47891918726287, 190.26, 'X[4] <= 0.355\ngini = 0.111\nsamples = 17\nvalue = [1,
 16]'),
 Text(146.5291656324244, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(148.42867274210136, 172.14, 'gini = 0.0\nsamples = 16\nvalue = [0, 16]'),
 Text(150.32817985177832, 208.38, 'X[3] <= 0.413\ngini = 0.32\nsamples = 5\nvalue = [1,
 4]'),
 Text(149.37842629693984, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(151.2779334066168, 190.26, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(150.32817985177832, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(151.2779334066168, 244.61999999999998, 'gini = 0.0\nsamples = 293\nvalue = [0, 29
3]'),
 Text(155.9079819864544, 298.98, 'X[3] <= 0.599\ngini = 0.143\nsamples = 90\nvalue = [7, 8
3]'),
 Text(153.17744051629376, 280.86, 'X[4] <= 0.151\ngini = 0.375\nsamples = 4\nvalue = [3,
 1]'),
 Text(152.22768696145528, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(154.12719407113224, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(158.63852345661502, 280.86, 'X[1] <= 0.762\ngini = 0.089\nsamples = 86\nvalue = [4,
 82]'),
 Text(156.0267011808092, 262.74, 'X[0] <= 0.194\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(155.07694762597072, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(156.97645473564768, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(161.25034573242084, 262.74, 'X[1] <= 0.973\ngini = 0.07\nsamples = 83\nvalue = [3, 8
0]'),
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 Text(158.87596184532464, 244.61999999999998, 'X[3] <= 0.936\ngini = 0.049\nsamples = 80\n
value = [2, 78]'),
 Text(156.97645473564768, 226.49999999999997, 'X[2] <= 0.769\ngini = 0.027\nsamples = 73\n
value = [1, 72]'),
 Text(156.0267011808092, 208.38, 'gini = 0.0\nsamples = 67\nvalue = [0, 67]'),
 Text(157.92620829048616, 208.38, 'X[2] <= 0.79\ngini = 0.278\nsamples = 6\nvalue = [1,
 5]'),
 Text(156.97645473564768, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(158.87596184532464, 190.26, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(160.7754689550016, 226.49999999999997, 'X[3] <= 0.937\ngini = 0.245\nsamples = 7\nva
lue = [1, 6]'),
 Text(159.82571540016312, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(161.72522250984008, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(163.62472961951704, 244.61999999999998, 'X[0] <= 0.209\ngini = 0.444\nsamples = 3\nv
alue = [1, 2]'),
 Text(162.67497606467856, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(164.57448317435552, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(158.75724265096983, 317.1, 'X[2] <= 0.57\ngini = 0.5\nsamples = 2\nvalue = [1, 1]'),
 Text(157.80748909613135, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(159.7069962058083, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(190.32170845005496, 335.21999999999997, 'X[0] <= 0.3\ngini = 0.131\nsamples = 637\nv
alue = [45, 592]'),
 Text(189.37195489521648, 317.1, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(191.27146200489344, 317.1, 'X[3] <= 0.578\ngini = 0.129\nsamples = 636\nvalue = [44,
 592]'),
 Text(179.02854508705366, 298.98, 'X[1] <= 0.73\ngini = 0.179\nsamples = 342\nvalue = [34,
 308]'),
 Text(178.07879153221518, 280.86, 'X[1] <= 0.503\ngini = 0.157\nsamples = 337\nvalue = [2
9, 308]'),
 Text(169.32325094854792, 262.74, 'X[2] <= 0.121\ngini = 0.064\nsamples = 180\nvalue = [6,
 174]'),
 Text(167.42374383887096, 244.61999999999998, 'X[4] <= 0.3\ngini = 0.5\nsamples = 2\nvalue
 = [1, 1]'),
 Text(166.47399028403248, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(168.37349739370944, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(171.22275805822488, 244.61999999999998, 'X[2] <= 0.541\ngini = 0.055\nsamples = 178
\nvalue = [5, 173]'),
 Text(170.2730045033864, 226.49999999999997, 'gini = 0.0\nsamples = 107\nvalue = [0, 10
7]'),
 Text(172.17251161306336, 226.49999999999997, 'X[2] <= 0.547\ngini = 0.131\nsamples = 71\n
value = [5, 66]'),
 Text(171.22275805822488, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(173.12226516790184, 208.38, 'X[3] <= 0.531\ngini = 0.083\nsamples = 69\nvalue = [3,
 66]'),
 Text(170.74788128080564, 190.26, 'X[1] <= 0.358\ngini = 0.059\nsamples = 66\nvalue = [2,
 64]'),
 Text(168.84837417112868, 172.14, 'X[1] <= 0.348\ngini = 0.245\nsamples = 7\nvalue = [1,
 6]'),
 Text(167.8986206162902, 154.01999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(169.79812772596716, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(172.6473883904826, 172.14, 'X[1] <= 0.491\ngini = 0.033\nsamples = 59\nvalue = [1, 5
8]'),
 Text(171.69763483564412, 154.01999999999998, 'gini = 0.0\nsamples = 52\nvalue = [0, 5
2]'),
 Text(173.59714194532108, 154.01999999999998, 'X[1] <= 0.491\ngini = 0.245\nsamples = 7\nv
alue = [1, 6]'),
 Text(172.6473883904826, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(174.54689550015956, 135.89999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(175.49664905499804, 190.26, 'X[3] <= 0.543\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(174.54689550015956, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(176.44640260983653, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(186.8343321158824, 262.74, 'X[3] <= 0.363\ngini = 0.25\nsamples = 157\nvalue = [23,
 134]'),
 Text(183.80699265983475, 244.61999999999998, 'X[4] <= 0.187\ngini = 0.32\nsamples = 5\nva
lue = [4, 1]'),
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 Text(182.85723910499627, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(184.75674621467323, 226.49999999999997, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(189.86167157193006, 244.61999999999998, 'X[4] <= 0.349\ngini = 0.219\nsamples = 152
\nvalue = [19, 133]'),
 Text(186.6562533243502, 226.49999999999997, 'X[3] <= 0.576\ngini = 0.18\nsamples = 140\nv
alue = [14, 126]'),
 Text(185.7064997695117, 208.38, 'X[1] <= 0.519\ngini = 0.17\nsamples = 139\nvalue = [13,
 126]'),
 Text(180.24541682919045, 190.26, 'X[3] <= 0.482\ngini = 0.351\nsamples = 22\nvalue = [5,
 17]'),
 Text(178.3459097195135, 172.14, 'X[4] <= 0.134\ngini = 0.142\nsamples = 13\nvalue = [1, 1
2]'),
 Text(177.396156164675, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(179.29566327435197, 154.01999999999998, 'gini = 0.0\nsamples = 12\nvalue = [0, 1
2]'),
 Text(182.1449239388674, 172.14, 'X[0] <= 0.372\ngini = 0.494\nsamples = 9\nvalue = [4,
 5]'),
 Text(181.19517038402893, 154.01999999999998, 'X[2] <= 0.483\ngini = 0.408\nsamples = 7\nv
alue = [2, 5]'),
 Text(180.24541682919045, 135.89999999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(182.1449239388674, 135.89999999999998, 'X[0] <= 0.306\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(181.19517038402893, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(183.0946774937059, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(183.0946774937059, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(191.16758270983297, 190.26, 'X[0] <= 0.403\ngini = 0.127\nsamples = 117\nvalue = [8,
 109]'),
 Text(188.79319882273677, 172.14, 'X[2] <= 0.445\ngini = 0.114\nsamples = 115\nvalue = [7,
 108]'),
 Text(186.8936917130598, 154.01999999999998, 'X[2] <= 0.439\ngini = 0.215\nsamples = 49\nv
alue = [6, 43]'),
 Text(185.94393815822133, 135.89999999999998, 'X[0] <= 0.364\ngini = 0.187\nsamples = 48\n
value = [5, 43]'),
 Text(184.99418460338285, 117.77999999999997, 'X[0] <= 0.36\ngini = 0.278\nsamples = 30\nv
alue = [5, 25]'),
 Text(184.04443104854437, 99.65999999999997, 'X[1] <= 0.592\ngini = 0.238\nsamples = 29\nv
alue = [4, 25]'),
 Text(181.19517038402893, 81.53999999999996, 'X[4] <= 0.304\ngini = 0.091\nsamples = 21\nv
alue = [1, 20]'),
 Text(180.24541682919045, 63.41999999999996, 'gini = 0.0\nsamples = 16\nvalue = [0, 16]'),
 Text(182.1449239388674, 63.41999999999996, 'X[3] <= 0.506\ngini = 0.32\nsamples = 5\nvalu
e = [1, 4]'),
 Text(181.19517038402893, 45.299999999999955, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(183.0946774937059, 45.299999999999955, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(186.8936917130598, 81.53999999999996, 'X[1] <= 0.614\ngini = 0.469\nsamples = 8\nval
ue = [3, 5]'),
 Text(185.94393815822133, 63.41999999999996, 'X[3] <= 0.558\ngini = 0.375\nsamples = 4\nva
lue = [3, 1]'),
 Text(184.99418460338285, 45.299999999999955, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(186.8936917130598, 45.299999999999955, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(187.8434452678983, 63.41999999999996, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(185.94393815822133, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(186.8936917130598, 117.77999999999997, 'gini = 0.0\nsamples = 18\nvalue = [0, 18]'),
 Text(187.8434452678983, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(190.69270593241373, 154.01999999999998, 'X[2] <= 0.821\ngini = 0.03\nsamples = 66\nv
alue = [1, 65]'),
 Text(189.74295237757525, 135.89999999999998, 'gini = 0.0\nsamples = 61\nvalue = [0, 6
1]'),
 Text(191.6424594872522, 135.89999999999998, 'X[2] <= 0.842\ngini = 0.32\nsamples = 5\nval
ue = [1, 4]'),
 Text(190.69270593241373, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(192.5922130420907, 117.77999999999997, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(193.54196659692917, 172.14, 'X[2] <= 0.621\ngini = 0.5\nsamples = 2\nvalue = [1,
 1]'),
 Text(192.5922130420907, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(194.49172015176765, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
```

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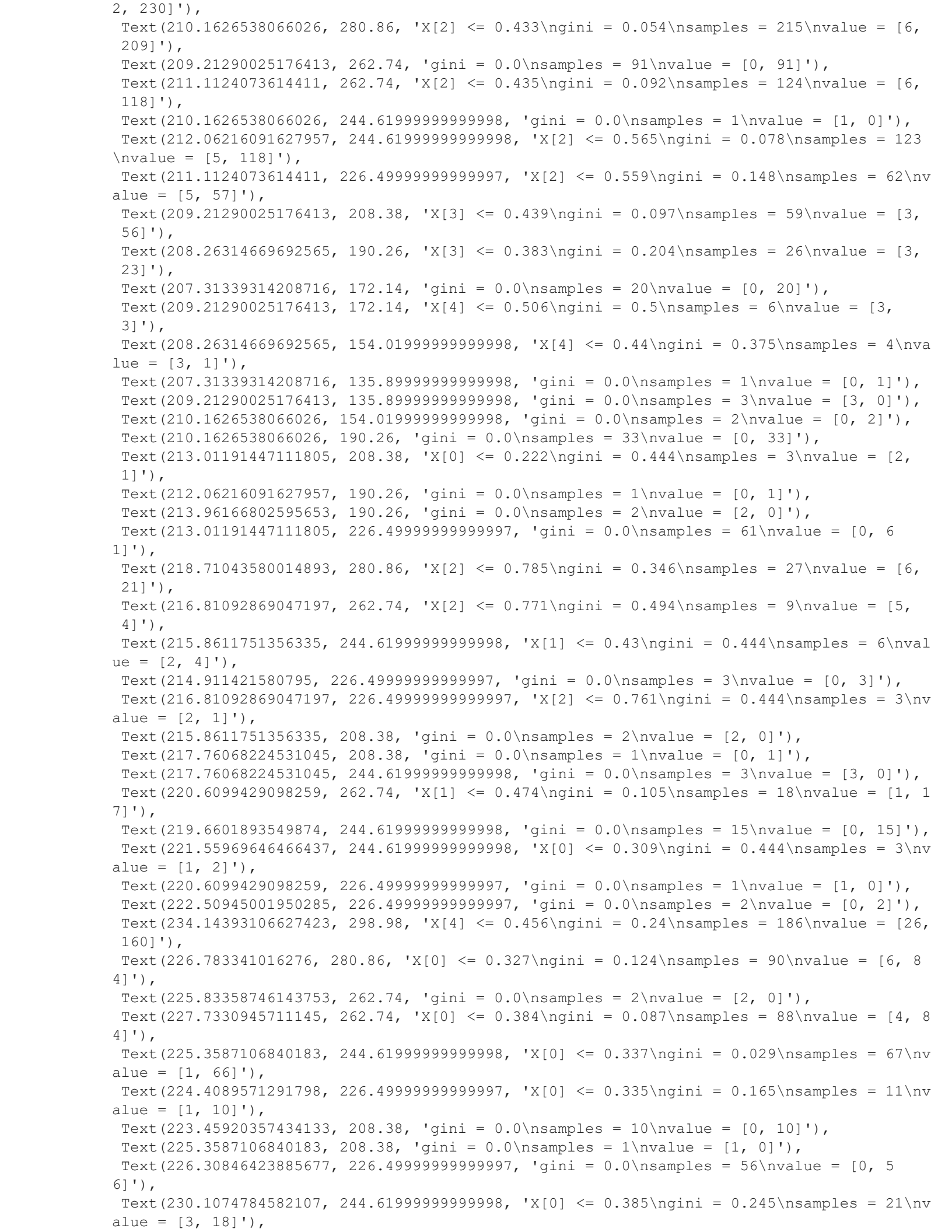
 Text(187.60600687918867, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(193.06708981950993, 226.49999999999997, 'X[3] <= 0.463\ngini = 0.486\nsamples = 12\n
value = [5, 7]'),
 Text(192.11733626467145, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(194.0168433743484, 208.38, 'X[1] <= 0.645\ngini = 0.346\nsamples = 9\nvalue = [2,
 7]'),
 Text(193.06708981950993, 190.26, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(194.96659692918692, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(179.97829864189214, 280.86, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(203.51437892273324, 298.98, 'X[1] <= 0.89\ngini = 0.066\nsamples = 294\nvalue = [10,
 284]'),
 Text(200.6651182582178, 280.86, 'X[4] <= 0.355\ngini = 0.049\nsamples = 280\nvalue = [7,
 273]'),
 Text(197.81585759370236, 262.74, 'X[4] <= 0.215\ngini = 0.038\nsamples = 259\nvalue = [5,
 254]'),
 Text(196.86610403886388, 244.61999999999998, 'gini = 0.0\nsamples = 104\nvalue = [0, 10
4]'),
 Text(198.76561114854084, 244.61999999999998, 'X[4] <= 0.216\ngini = 0.062\nsamples = 155
\nvalue = [5, 150]'),
 Text(197.81585759370236, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(199.71536470337932, 226.49999999999997, 'X[4] <= 0.222\ngini = 0.051\nsamples = 154
\nvalue = [4, 150]'),
 Text(197.81585759370236, 208.38, 'X[0] <= 0.309\ngini = 0.32\nsamples = 10\nvalue = [2,
 8]'),
 Text(196.86610403886388, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(198.76561114854084, 190.26, 'X[1] <= 0.635\ngini = 0.198\nsamples = 9\nvalue = [1,
 8]'),
 Text(197.81585759370236, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(199.71536470337932, 172.14, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(201.61487181305628, 208.38, 'X[1] <= 0.761\ngini = 0.027\nsamples = 144\nvalue = [2,
 142]'),
 Text(200.6651182582178, 190.26, 'gini = 0.0\nsamples = 128\nvalue = [0, 128]'),
 Text(202.56462536789476, 190.26, 'X[1] <= 0.764\ngini = 0.219\nsamples = 16\nvalue = [2,
 14]'),
 Text(201.61487181305628, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(203.51437892273324, 172.14, 'X[4] <= 0.33\ngini = 0.124\nsamples = 15\nvalue = [1, 1
4]'),
 Text(202.56462536789476, 154.01999999999998, 'gini = 0.0\nsamples = 13\nvalue = [0, 1
3]'),
 Text(204.46413247757172, 154.01999999999998, 'X[4] <= 0.337\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(203.51437892273324, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(205.4138860324102, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(203.51437892273324, 262.74, 'X[1] <= 0.782\ngini = 0.172\nsamples = 21\nvalue = [2,
 19]'),
 Text(202.56462536789476, 244.61999999999998, 'X[4] <= 0.357\ngini = 0.095\nsamples = 20\n
value = [1, 19]'),
 Text(201.61487181305628, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(203.51437892273324, 226.49999999999997, 'gini = 0.0\nsamples = 19\nvalue = [0, 1
9]'),
 Text(204.46413247757172, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(206.36363958724868, 280.86, 'X[3] <= 0.751\ngini = 0.337\nsamples = 14\nvalue = [3,
 11]'),
 Text(205.4138860324102, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(207.31339314208716, 262.74, 'gini = 0.0\nsamples = 11\nvalue = [0, 11]'),
 Text(245.48161412715862, 353.34, 'X[1] <= 0.513\ngini = 0.263\nsamples = 732\nvalue = [11
4, 618]'),
 Text(217.93876103684266, 335.21999999999997, 'X[3] <= 0.237\ngini = 0.187\nsamples = 441
\nvalue = [46, 395]'),
 Text(211.58728413886033, 317.1, 'X[3] <= 0.2\ngini = 0.473\nsamples = 13\nvalue = [8,
 5]'),
 Text(210.63753058402185, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(212.5370376936988, 298.98, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(224.290237934825, 317.1, 'X[0] <= 0.325\ngini = 0.162\nsamples = 428\nvalue = [38, 3
90]'),
 Text(214.43654480337577, 298.98, 'X[2] <= 0.737\ngini = 0.094\nsamples = 242\nvalue = [1
```


2, 230]'),
Text(210.1626538066026, 280.86, 'X[2] <= 0.433\ngini = 0.054\nsamples = 215\nvalue = [6, 209]'),
Text(209.21290025176413, 262.74, 'gini = 0.0\nsamples = 91\nvalue = [0, 91]'),
Text(211.1124073614411, 262.74, 'X[2] <= 0.435\ngini = 0.092\nsamples = 124\nvalue = [6, 118]'),
Text(210.1626538066026, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(212.06216091627957, 244.61999999999998, 'X[2] <= 0.565\ngini = 0.078\nsamples = 123\nvalue = [5, 118]'),
Text(211.1124073614411, 226.49999999999997, 'X[2] <= 0.559\ngini = 0.148\nsamples = 62\nvalue = [5, 57]'),
Text(209.21290025176413, 208.38, 'X[3] <= 0.439\ngini = 0.097\nsamples = 59\nvalue = [3, 56]'),
Text(208.26314669692565, 190.26, 'X[3] <= 0.383\ngini = 0.204\nsamples = 26\nvalue = [3, 23]'),
Text(207.31339314208716, 172.14, 'gini = 0.0\nsamples = 20\nvalue = [0, 20]'),
Text(209.21290025176413, 172.14, 'X[4] <= 0.506\ngini = 0.5\nsamples = 6\nvalue = [3, 3]'),
Text(208.26314669692565, 154.01999999999998, 'X[4] <= 0.44\ngini = 0.375\nsamples = 4\nvalue = [3, 1]'),
Text(207.31339314208716, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(209.21290025176413, 135.89999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(210.1626538066026, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(210.1626538066026, 190.26, 'gini = 0.0\nsamples = 33\nvalue = [0, 33]'),
Text(213.01191447111805, 208.38, 'X[0] <= 0.222\ngini = 0.444\nsamples = 3\nvalue = [2, 1]'),
Text(212.06216091627957, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(213.96166802595653, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(213.01191447111805, 226.49999999999997, 'gini = 0.0\nsamples = 61\nvalue = [0, 61]'),
Text(218.71043580014893, 280.86, 'X[2] <= 0.785\ngini = 0.346\nsamples = 27\nvalue = [6, 21]'),
Text(216.81092869047197, 262.74, 'X[2] <= 0.771\ngini = 0.494\nsamples = 9\nvalue = [5, 4]'),
Text(215.8611751356335, 244.61999999999998, 'X[1] <= 0.43\ngini = 0.444\nsamples = 6\nvalue = [2, 4]'),
Text(214.911421580795, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(216.81092869047197, 226.49999999999997, 'X[2] <= 0.761\ngini = 0.444\nsamples = 3\nvalue = [2, 1]'),
Text(215.8611751356335, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(217.76068224531045, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(217.76068224531045, 244.61999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(220.6099429098259, 262.74, 'X[1] <= 0.474\ngini = 0.105\nsamples = 18\nvalue = [1, 17]'),
Text(219.6601893549874, 244.61999999999998, 'gini = 0.0\nsamples = 15\nvalue = [0, 15]'),
Text(221.55969646466437, 244.61999999999998, 'X[0] <= 0.309\ngini = 0.444\nsamples = 3\nvalue = [1, 2]'),
Text(220.6099429098259, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(222.50945001950285, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(234.14393106627423, 298.98, 'X[4] <= 0.456\ngini = 0.24\nsamples = 186\nvalue = [26, 160]'),
Text(226.783341016276, 280.86, 'X[0] <= 0.327\ngini = 0.124\nsamples = 90\nvalue = [6, 84]'),
Text(225.83358746143753, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(227.7330945711145, 262.74, 'X[0] <= 0.384\ngini = 0.087\nsamples = 88\nvalue = [4, 84]'),
Text(225.3587106840183, 244.61999999999998, 'X[0] <= 0.337\ngini = 0.029\nsamples = 67\nvalue = [1, 66]'),
Text(224.4089571291798, 226.49999999999997, 'X[0] <= 0.335\ngini = 0.165\nsamples = 11\nvalue = [1, 10]'),
Text(223.45920357434133, 208.38, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
Text(225.3587106840183, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(226.30846423885677, 226.49999999999997, 'gini = 0.0\nsamples = 56\nvalue = [0, 56]'),
Text(230.1074784582107, 244.61999999999998, 'X[0] <= 0.385\ngini = 0.245\nsamples = 21\nvalue = [3, 18]'),

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 Text(228.20797134853373, 226.49999999999997, 'X[2] <= 0.685\ngini = 0.444\nsamples = 3\nv
alue = [2, 1]'),
 Text(227.25821779369525, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(229.1577249033722, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(232.00698556788765, 226.49999999999997, 'X[3] <= 0.307\ngini = 0.105\nsamples = 18\n
value = [1, 17]'),
 Text(231.05723201304917, 208.38, 'X[2] <= 0.63\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(230.1074784582107, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(232.00698556788765, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(232.95673912272613, 208.38, 'gini = 0.0\nsamples = 15\nvalue = [0, 15]'),
 Text(241.50452111627246, 280.86, 'X[4] <= 0.64\ngini = 0.33\nsamples = 96\nvalue = [20, 7
6]'),
 Text(240.55476756143398, 262.74, 'X[3] <= 0.61\ngini = 0.391\nsamples = 75\nvalue = [20,
 55]'),
 Text(239.6050140065955, 244.61999999999998, 'X[3] <= 0.382\ngini = 0.349\nsamples = 71\nv
alue = [16, 55]'),
 Text(235.80599978724157, 226.49999999999997, 'X[1] <= 0.387\ngini = 0.48\nsamples = 25\nv
alue = [10, 15]'),
 Text(234.8562462324031, 208.38, 'X[4] <= 0.456\ngini = 0.278\nsamples = 18\nvalue = [3, 1
5]'),
 Text(233.90649267756461, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(235.80599978724157, 190.26, 'X[2] <= 0.261\ngini = 0.208\nsamples = 17\nvalue = [2,
 15]'),
 Text(234.8562462324031, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(236.75575334208006, 172.14, 'X[3] <= 0.369\ngini = 0.117\nsamples = 16\nvalue = [1,
 15]'),
 Text(235.80599978724157, 154.01999999999998, 'gini = 0.0\nsamples = 13\nvalue = [0, 1
3]'),
 Text(237.70550689691854, 154.01999999999998, 'X[2] <= 0.514\ngini = 0.444\nsamples = 3\nv
alue = [1, 2]'),
 Text(236.75575334208006, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(238.65526045175702, 135.89999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(236.75575334208006, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(243.40402822594945, 226.49999999999997, 'X[2] <= 0.605\ngini = 0.227\nsamples = 46\n
value = [6, 40]'),
 Text(240.55476756143398, 208.38, 'X[0] <= 0.389\ngini = 0.108\nsamples = 35\nvalue = [2,
 33]'),
 Text(239.6050140065955, 190.26, 'gini = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(241.50452111627246, 190.26, 'X[0] <= 0.401\ngini = 0.444\nsamples = 6\nvalue = [2,
 4]'),
 Text(240.55476756143398, 172.14, 'X[4] <= 0.498\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(239.6050140065955, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(241.50452111627246, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(242.45427467111094, 172.14, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(246.2532888904649, 208.38, 'X[4] <= 0.508\ngini = 0.463\nsamples = 11\nvalue = [4,
 7]'),
 Text(245.3035353356264, 190.26, 'X[1] <= 0.323\ngini = 0.219\nsamples = 8\nvalue = [1,
 7]'),
 Text(244.35378178078793, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(246.2532888904649, 172.14, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(247.20304244530337, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(241.50452111627246, 244.61999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(242.45427467111094, 262.74, 'gini = 0.0\nsamples = 21\nvalue = [0, 21]'),
 Text(273.0244672174746, 335.21999999999997, 'X[4] <= 0.604\ngini = 0.358\nsamples = 291\n
value = [68, 223]'),
 Text(263.70501046062196, 317.1, 'X[3] <= 0.513\ngini = 0.454\nsamples = 184\nvalue = [64,
 120]'),
 Text(255.51338605014007, 298.98, 'X[1] <= 0.755\ngini = 0.441\nsamples = 73\nvalue = [49,
 24]'),
 Text(250.52717988723805, 280.86, 'X[0] <= 0.158\ngini = 0.282\nsamples = 53\nvalue = [44,
 9]'),
 Text(249.57742633239957, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(251.47693344207653, 262.74, 'X[4] <= 0.395\ngini = 0.237\nsamples = 51\nvalue = [44,
 7]'),
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 Text(248.15279600014185, 244.61999999999998, 'X[2] <= 0.581\ngini = 0.49\nsamples = 7\nva
lue = [4, 3]'),
 Text(247.20304244530337, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(249.10254955498033, 226.49999999999997, 'X[2] <= 0.743\ngini = 0.32\nsamples = 5\nva
lue = [4, 1]'),
 Text(248.15279600014185, 208.38, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(250.0523031098188, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(254.8010708840112, 244.61999999999998, 'X[4] <= 0.579\ngini = 0.165\nsamples = 44\nv
alue = [40, 4]'),
 Text(252.90156377433425, 226.49999999999997, 'X[1] <= 0.515\ngini = 0.095\nsamples = 40\n
value = [38, 2]'),
 Text(251.95181021949577, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(253.85131732917273, 208.38, 'X[1] <= 0.539\ngini = 0.05\nsamples = 39\nvalue = [38,
 1]'),
 Text(252.90156377433425, 190.26, 'X[3] <= 0.382\ngini = 0.375\nsamples = 4\nvalue = [3,
 1]'),
 Text(251.95181021949577, 172.14, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(253.85131732917273, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(254.8010708840112, 190.26, 'gini = 0.0\nsamples = 35\nvalue = [35, 0]'),
 Text(256.70057799368817, 226.49999999999997, 'X[2] <= 0.424\ngini = 0.5\nsamples = 4\nval
ue = [2, 2]'),
 Text(255.7508244388497, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(257.65033154852665, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(260.4995922130421, 280.86, 'X[3] <= 0.437\ngini = 0.375\nsamples = 20\nvalue = [5, 1
5]'),
 Text(258.60008510336513, 262.74, 'X[1] <= 0.942\ngini = 0.133\nsamples = 14\nvalue = [1,
 13]'),
 Text(257.65033154852665, 244.61999999999998, 'gini = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
 Text(259.5498386582036, 244.61999999999998, 'X[4] <= 0.504\ngini = 0.444\nsamples = 3\nva
lue = [1, 2]'),
 Text(258.60008510336513, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(260.4995922130421, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(262.39909932271905, 262.74, 'X[0] <= 0.398\ngini = 0.444\nsamples = 6\nvalue = [4,
 2]'),
 Text(261.4493457678806, 244.61999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(263.34885287755753, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(271.89663487110386, 298.98, 'X[1] <= 0.671\ngini = 0.234\nsamples = 111\nvalue = [1
5, 96]'),
 Text(268.09762065174993, 280.86, 'X[4] <= 0.567\ngini = 0.112\nsamples = 84\nvalue = [5,
 79]'),
 Text(266.198113542073, 262.74, 'X[2] <= 0.163\ngini = 0.071\nsamples = 81\nvalue = [3, 7
8]'),
 Text(265.2483599872345, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(267.14786709691145, 244.61999999999998, 'X[2] <= 0.845\ngini = 0.049\nsamples = 80\n
value = [2, 78]'),
 Text(265.2483599872345, 226.49999999999997, 'X[1] <= 0.54\ngini = 0.026\nsamples = 76\nva
lue = [1, 75]'),
 Text(264.298606432396, 208.38, 'X[1] <= 0.536\ngini = 0.142\nsamples = 13\nvalue = [1, 1
2]'),
 Text(263.34885287755753, 190.26, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(265.2483599872345, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(266.198113542073, 208.38, 'gini = 0.0\nsamples = 63\nvalue = [0, 63]'),
 Text(269.0473742065884, 226.49999999999997, 'X[2] <= 0.873\ngini = 0.375\nsamples = 4\nva
lue = [1, 3]'),
 Text(268.09762065174993, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(269.9971277614269, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(269.9971277614269, 262.74, 'X[2] <= 0.462\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(269.0473742065884, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(270.9468813162654, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(275.6956490904578, 280.86, 'X[3] <= 0.667\ngini = 0.466\nsamples = 27\nvalue = [10,
 17]'),
 Text(273.7961419807808, 262.74, 'X[4] <= 0.501\ngini = 0.492\nsamples = 16\nvalue = [9,
 7]'),
 Text(272.84638842594234, 244.61999999999998, 'X[2] <= 0.84\ngini = 0.18\nsamples = 10\nva
```

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lue = [9, 1]'),
 Text(271.89663487110386, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(273.7961419807808, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(274.7458955356193, 244.61999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(277.59515620013474, 262.74, 'X[3] <= 0.893\ngini = 0.165\nsamples = 11\nvalue = [1,
 10]'),
 Text(276.64540264529626, 244.61999999999998, 'gini = 0.0\nsamples = 10\nvalue = [0, 1
0]'),
 Text(278.5449097549732, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(282.34392397432714, 317.1, 'X[2] <= 0.113\ngini = 0.072\nsamples = 107\nvalue = [4,
 103]'),
 Text(281.39417041948866, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(283.2936775291656, 298.98, 'X[0] <= 0.253\ngini = 0.055\nsamples = 106\nvalue = [3,
 103]'),
 Text(280.4444168646502, 280.86, 'X[3] <= 0.493\ngini = 0.444\nsamples = 6\nvalue = [2,
 4]'),
 Text(279.4946633098117, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(281.39417041948866, 262.74, 'X[1] <= 0.635\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(280.4444168646502, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(282.34392397432714, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(286.14293819368106, 280.86, 'X[4] <= 0.618\ngini = 0.02\nsamples = 100\nvalue = [1,
 99]'),
 Text(285.1931846388426, 262.74, 'X[4] <= 0.614\ngini = 0.18\nsamples = 10\nvalue = [1,
 9]'),
 Text(284.2434310840041, 244.61999999999998, 'gini = 0.0\nsamples = 9\nvalue = [0, 9]'),
 Text(286.14293819368106, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(287.09269174851954, 262.74, 'gini = 0.0\nsamples = 90\nvalue = [0, 90]'),
 Text(506.3602324399512, 389.58, 'X[4] <= 0.426\ngini = 0.458\nsamples = 4072\nvalue = [14
47, 2625]'),
 Text(373.253147051523, 371.46, 'X[0] <= 0.485\ngini = 0.475\nsamples = 1473\nvalue = [90
0, 573]'),
 Text(320.01871830786143, 353.34, 'X[3] <= 0.197\ngini = 0.403\nsamples = 447\nvalue = [12
5, 322]'),
 Text(311.5340058863161, 335.21999999999997, 'X[1] <= 0.307\ngini = 0.245\nsamples = 7\nva
lue = [6, 1]'),
 Text(310.5842523314776, 317.1, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(312.4837594411546, 317.1, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(328.5034307294068, 335.21999999999997, 'X[1] <= 0.866\ngini = 0.395\nsamples = 440\n
value = [119, 321]'),
 Text(314.38326655083154, 317.1, 'X[4] <= 0.235\ngini = 0.387\nsamples = 434\nvalue = [11
4, 320]'),
 Text(288.9921988581965, 298.98, 'X[1] <= 0.412\ngini = 0.233\nsamples = 89\nvalue = [12,
 77]'),
 Text(288.042445303358, 280.86, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(289.941952413035, 280.86, 'X[2] <= 0.954\ngini = 0.187\nsamples = 86\nvalue = [9, 7
7]'),
 Text(288.9921988581965, 262.74, 'X[3] <= 0.514\ngini = 0.171\nsamples = 85\nvalue = [8, 7
7]'),
 Text(288.042445303358, 244.61999999999998, 'gini = 0.0\nsamples = 21\nvalue = [0, 21]'),
 Text(289.941952413035, 244.61999999999998, 'X[1] <= 0.543\ngini = 0.219\nsamples = 64\nva
lue = [8, 56]'),
 Text(288.9921988581965, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(290.89170596787346, 226.49999999999997, 'X[0] <= 0.483\ngini = 0.175\nsamples = 62\n
value = [6, 56]'),
 Text(289.941952413035, 208.38, 'X[4] <= 0.18\ngini = 0.15\nsamples = 61\nvalue = [5, 5
6]'),
 Text(288.042445303358, 190.26, 'X[0] <= 0.475\ngini = 0.269\nsamples = 25\nvalue = [4, 2
1]'),
 Text(287.09269174851954, 172.14, 'X[4] <= 0.163\ngini = 0.219\nsamples = 24\nvalue = [3,
 21]'),
 Text(286.14293819368106, 154.01999999999998, 'gini = 0.0\nsamples = 17\nvalue = [0, 1
7]'),
 Text(288.042445303358, 154.01999999999998, 'X[2] <= 0.644\ngini = 0.49\nsamples = 7\nvalu
e = [3, 4]'),
 Text(287.09269174851954, 135.89999999999998, 'X[4] <= 0.178\ngini = 0.32\nsamples = 5\nva
```

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lue = [1, 4]'),
 Text(286.14293819368106, 117.77999999999997, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(288.042445303358, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(288.9921988581965, 135.89999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(288.9921988581965, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(291.84145952271194, 190.26, 'X[1] <= 0.614\ngini = 0.054\nsamples = 36\nvalue = [1,
 35]'),
 Text(290.89170596787346, 172.14, 'X[1] <= 0.612\ngini = 0.219\nsamples = 8\nvalue = [1,
 7]'),
 Text(289.941952413035, 154.01999999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(291.84145952271194, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(292.7912130775504, 172.14, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(291.84145952271194, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(290.89170596787346, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(339.7743342434665, 298.98, 'X[1] <= 0.682\ngini = 0.416\nsamples = 345\nvalue = [10
2, 243]'),
 Text(326.4481046771391, 280.86, 'X[3] <= 0.55\ngini = 0.382\nsamples = 303\nvalue = [78,
 225]'),
 Text(314.7542640331903, 262.74, 'X[1] <= 0.531\ngini = 0.421\nsamples = 219\nvalue = [66,
 153]'),
 Text(305.85032445657953, 244.61999999999998, 'X[3] <= 0.54\ngini = 0.347\nsamples = 170\n
value = [38, 132]'),
 Text(304.90057090174105, 226.49999999999997, 'X[0] <= 0.435\ngini = 0.337\nsamples = 168
\nvalue = [36, 132]'),
 Text(298.01485762916207, 208.38, 'X[4] <= 0.383\ngini = 0.229\nsamples = 76\nvalue = [10,
 66]'),
 Text(297.0651040743236, 190.26, 'X[1] <= 0.33\ngini = 0.293\nsamples = 56\nvalue = [10, 4
6]'),
 Text(294.6907201872274, 172.14, 'X[2] <= 0.21\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(293.7409666323889, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(295.64047374206586, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(299.4394879614198, 172.14, 'X[2] <= 0.576\ngini = 0.256\nsamples = 53\nvalue = [8, 4
5]'),
 Text(297.5399808517428, 154.01999999999998, 'X[4] <= 0.38\ngini = 0.105\nsamples = 36\nva
lue = [2, 34]'),
 Text(296.59022729690435, 135.89999999999998, 'X[4] <= 0.254\ngini = 0.056\nsamples = 35\n
value = [1, 34]'),
 Text(295.64047374206586, 117.77999999999997, 'X[4] <= 0.251\ngini = 0.375\nsamples = 4\nv
alue = [1, 3]'),
 Text(294.6907201872274, 99.65999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(296.59022729690435, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(297.5399808517428, 117.77999999999997, 'gini = 0.0\nsamples = 31\nvalue = [0, 31]'),
 Text(298.4897344065813, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(301.33899507109675, 154.01999999999998, 'X[4] <= 0.32\ngini = 0.457\nsamples = 17\nv
alue = [6, 11]'),
 Text(300.38924151625827, 135.89999999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(302.2887486259352, 135.89999999999998, 'X[3] <= 0.379\ngini = 0.444\nsamples = 9\nva
lue = [6, 3]'),
 Text(301.33899507109675, 117.77999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(303.2385021807737, 117.77999999999997, 'X[3] <= 0.473\ngini = 0.5\nsamples = 6\nvalu
e = [3, 3]'),
 Text(302.2887486259352, 99.65999999999997, 'X[1] <= 0.439\ngini = 0.375\nsamples = 4\nval
ue = [1, 3]'),
 Text(301.33899507109675, 81.53999999999996, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(303.2385021807737, 81.53999999999996, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(304.1882557356122, 99.65999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(298.96461118400055, 190.26, 'gini = 0.0\nsamples = 20\nvalue = [0, 20]'),
 Text(311.78628417432003, 208.38, 'X[1] <= 0.425\ngini = 0.405\nsamples = 92\nvalue = [26,
 66]'),
 Text(308.9370235098046, 190.26, 'X[4] <= 0.415\ngini = 0.488\nsamples = 38\nvalue = [16,
 22]'),
 Text(307.9872699549661, 172.14, 'X[1] <= 0.341\ngini = 0.5\nsamples = 32\nvalue = [16, 1
6]'),
 Text(306.08776284528915, 154.01999999999998, 'X[4] <= 0.255\ngini = 0.245\nsamples = 7\nv
alue = [1, 6]'),
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 Text(305.13800929045067, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(307.03751640012763, 135.89999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(309.88677706464307, 154.01999999999998, 'X[4] <= 0.402\ngini = 0.48\nsamples = 25\nv
alue = [15, 10]'),
 Text(308.9370235098046, 135.89999999999998, 'X[3] <= 0.431\ngini = 0.499\nsamples = 21\nv
alue = [11, 10]'),
 Text(307.03751640012763, 117.77999999999997, 'X[4] <= 0.292\ngini = 0.48\nsamples = 15\nv
alue = [6, 9]'),
 Text(306.08776284528915, 99.65999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(307.9872699549661, 99.65999999999997, 'X[1] <= 0.414\ngini = 0.375\nsamples = 12\nva
lue = [3, 9]'),
 Text(306.08776284528915, 81.53999999999996, 'X[2] <= 0.676\ngini = 0.198\nsamples = 9\nva
lue = [1, 8]'),
 Text(305.13800929045067, 63.41999999999996, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(307.03751640012763, 63.41999999999996, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(309.88677706464307, 81.53999999999996, 'X[1] <= 0.421\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(308.9370235098046, 63.41999999999996, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(310.83653061948155, 63.41999999999996, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(310.83653061948155, 117.77999999999997, 'X[1] <= 0.409\ngini = 0.278\nsamples = 6\nv
alue = [5, 1]'),
 Text(309.88677706464307, 99.65999999999997, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(311.78628417432003, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(310.83653061948155, 135.89999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(309.88677706464307, 172.14, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(314.6355448388355, 190.26, 'X[3] <= 0.309\ngini = 0.302\nsamples = 54\nvalue = [10,
 44]'),
 Text(312.7360377291585, 172.14, 'X[1] <= 0.457\ngini = 0.444\nsamples = 6\nvalue = [4,
 2]'),
 Text(311.78628417432003, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(313.685791283997, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(316.5350519485125, 172.14, 'X[4] <= 0.245\ngini = 0.219\nsamples = 48\nvalue = [6, 4
2]'),
 Text(315.58529839367395, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(317.48480550335097, 154.01999999999998, 'X[4] <= 0.365\ngini = 0.19\nsamples = 47\nv
alue = [5, 42]'),
 Text(314.16066806141623, 135.89999999999998, 'X[3] <= 0.474\ngini = 0.059\nsamples = 33\n
value = [1, 32]'),
 Text(313.21091450657775, 117.77999999999997, 'gini = 0.0\nsamples = 26\nvalue = [0, 2
6]'),
 Text(315.1104216162547, 117.77999999999997, 'X[3] <= 0.487\ngini = 0.245\nsamples = 7\nva
lue = [1, 6]'),
 Text(314.16066806141623, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(316.0601751710932, 99.65999999999997, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(320.80894294528565, 135.89999999999998, 'X[3] <= 0.415\ngini = 0.408\nsamples = 14\n
value = [4, 10]'),
 Text(318.9094358356087, 117.77999999999997, 'X[2] <= 0.526\ngini = 0.48\nsamples = 5\nval
ue = [3, 2]'),
 Text(317.9596822807702, 99.65999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(319.85918939044717, 99.65999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(322.7084500549626, 117.77999999999997, 'X[0] <= 0.473\ngini = 0.198\nsamples = 9\nva
lue = [1, 8]'),
 Text(321.75869650012413, 99.65999999999997, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(323.6582036098011, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(306.800078011418, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(323.6582036098011, 244.61999999999998, 'X[1] <= 0.609\ngini = 0.49\nsamples = 49\nva
lue = [28, 21]'),
 Text(322.7084500549626, 226.49999999999997, 'X[3] <= 0.467\ngini = 0.499\nsamples = 40\nv
alue = [19, 21]'),
 Text(320.3340661678664, 208.38, 'X[2] <= 0.67\ngini = 0.337\nsamples = 14\nvalue = [11,
 3]'),
 Text(319.38431261302793, 190.26, 'X[3] <= 0.413\ngini = 0.26\nsamples = 13\nvalue = [11,
 2]'),
 Text(318.43455905818945, 172.14, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(320.3340661678664, 172.14, 'X[1] <= 0.559\ngini = 0.444\nsamples = 6\nvalue = [4,
 2]'),
```

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 Text(319.38431261302793, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(321.2838197227049, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(321.2838197227049, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(325.0828339420588, 208.38, 'X[3] <= 0.514\ngini = 0.426\nsamples = 26\nvalue = [8, 1
8]'),
 Text(323.18332683238185, 190.26, 'X[1] <= 0.6\ngini = 0.142\nsamples = 13\nvalue = [1, 1
2]'),
 Text(322.23357327754337, 172.14, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(324.13308038722033, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(326.9823410517358, 190.26, 'X[1] <= 0.55\ngini = 0.497\nsamples = 13\nvalue = [7,
 6]'),
 Text(326.0325874968973, 172.14, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(327.93209460657425, 172.14, 'X[2] <= 0.774\ngini = 0.375\nsamples = 8\nvalue = [2,
 6]'),
 Text(326.9823410517358, 154.01999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(328.88184816141273, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(324.6079571646396, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(338.14194532108 79, 262.74, 'X[1] <= 0.579\ngini = 0.245\nsamples = 84\nvalue = [12,
 72]'),
 Text(335.05524626786286, 244.61999999999998, 'X[3] <= 0.596\ngini = 0.389\nsamples = 34\n
value = [9, 25]'),
 Text(331.7311088259282, 226.49999999999997, 'X[0] <= 0.479\ngini = 0.147\nsamples = 25\nv
alue = [2, 23]'),
 Text(329.8316017162512, 208.38, 'X[2] <= 0.657\ngini = 0.083\nsamples = 23\nvalue = [1, 2
2]'),
 Text(328.88184816141273, 190.26, 'gini = 0.0\nsamples = 18\nvalue = [0, 18]'),
 Text(330.7813552710897, 190.26, 'X[2] <= 0.717\ngini = 0.32\nsamples = 5\nvalue = [1,
 4]'),
 Text(329.8316017162512, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(331.7311088259282, 172.14, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(333.63061593560514, 208.38, 'X[3] <= 0.574\ngini = 0.5\nsamples = 2\nvalue = [1,
 1]'),
 Text(332.68086238076665, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(334.5803694904436, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(338.37938370979754, 226.49999999999997, 'X[2] <= 0.379\ngini = 0.346\nsamples = 9\nv
alue = [7, 2]'),
 Text(337.42963015495906, 208.38, 'X[3] <= 0.671\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(336.4798766001206, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(338.37938370979754, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(339.329137264636, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(341.228644374313, 244.61999999999998, 'X[1] <= 0.654\ngini = 0.113\nsamples = 50\nva
lue = [3, 47]'),
 Text(340.2788908194745, 226.49999999999997, 'gini = 0.0\nsamples = 37\nvalue = [0, 37]'),
 Text(342.17839792915146, 226.49999999999997, 'X[1] <= 0.661\ngini = 0.355\nsamples = 13\n
value = [3, 10]'),
 Text(341.228644374313, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(343.12815148398994, 208.38, 'X[2] <= 0.694\ngini = 0.165\nsamples = 11\nvalue = [1,
 10]'),
 Text(342.17839792915146, 190.26, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(344.0779050388284, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(353.100563809794, 280.86, 'X[3] <= 0.688\ngini = 0.49\nsamples = 42\nvalue = [24, 1
8]'),
 Text(350.7261799226978, 262.74, 'X[1] <= 0.838\ngini = 0.227\nsamples = 23\nvalue = [20,
 3]'),
 Text(349.7764263678593, 244.61999999999998, 'X[3] <= 0.625\ngini = 0.165\nsamples = 22\nv
alue = [20, 2]'),
 Text(347.87691925818234, 226.49999999999997, 'X[3] <= 0.457\ngini = 0.1\nsamples = 19\nva
lue = [18, 1]'),
 Text(346.92716570334386, 208.38, 'X[3] <= 0.436\ngini = 0.32\nsamples = 5\nvalue = [4,
 1]'),
 Text(345.9774121485054, 190.26, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(347.87691925818234, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(348.8266728130208, 208.38, 'gini = 0.0\nsamples = 14\nvalue = [14, 0]'),
 Text(351.67593347753626, 226.49999999999997, 'X[3] <= 0.663\ngini = 0.444\nsamples = 3\nv
alue = [2, 1]'),
```

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 Text(350.7261799226978, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(352.62568703237474, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(351.67593347753626, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(355.4749476968902, 262.74, 'X[0] <= 0.456\ngini = 0.332\nsamples = 19\nvalue = [4, 1
5]'),
 Text(354.5251941420517, 244.61999999999998, 'X[2] <= 0.115\ngini = 0.208\nsamples = 17\nv
alue = [2, 15]'),
 Text(353.5754405872132, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(355.4749476968902, 226.49999999999997, 'X[1] <= 0.812\ngini = 0.117\nsamples = 16\nv
alue = [1, 15]'),
 Text(354.5251941420517, 208.38, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(356.42470125172866, 208.38, 'X[1] <= 0.816\ngini = 0.375\nsamples = 4\nvalue = [1,
 3]'),
 Text(355.4749476968902, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(357.37445480656714, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(356.42470125172866, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(342.623594907982, 317.1, 'X[4] <= 0.144\ngini = 0.278\nsamples = 6\nvalue = [5,
 1]'),
 Text(341.67384135314353, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(343.5733484628205, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(426.48757579518457, 353.34, 'X[3] <= 0.449\ngini = 0.37\nsamples = 1026\nvalue = [77
5, 251]'),
 Text(394.1032055600865, 335.21999999999997, 'X[1] <= 0.617\ngini = 0.488\nsamples = 281\n
value = [162, 119]'),
 Text(376.6960036878125, 317.1, 'X[0] <= 0.525\ngini = 0.451\nsamples = 236\nvalue = [155,
 81]'),
 Text(364.2601680791461, 298.98, 'X[0] <= 0.49\ngini = 0.492\nsamples = 57\nvalue = [25, 3
2]'),
 Text(362.36066096946917, 280.86, 'X[4] <= 0.316\ngini = 0.298\nsamples = 11\nvalue = [9,
 2]'),
 Text(361.4109074146307, 262.74, 'X[3] <= 0.402\ngini = 0.5\nsamples = 4\nvalue = [2,
 2]'),
 Text(360.4611538597922, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(362.36066096946917, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(363.31041452430765, 262.74, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(366.1596751888231, 280.86, 'X[4] <= 0.421\ngini = 0.454\nsamples = 46\nvalue = [16,
 30]'),
 Text(365.2099216339846, 262.74, 'X[3] <= 0.24\ngini = 0.408\nsamples = 42\nvalue = [12, 3
0]'),
 Text(364.2601680791461, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(366.1596751888231, 244.61999999999998, 'X[1] <= 0.54\ngini = 0.375\nsamples = 40\nva
lue = [10, 30]'),
 Text(363.54785291301727, 226.49999999999997, 'X[0] <= 0.503\ngini = 0.32\nsamples = 35\nv
alue = [7, 28]'),
 Text(361.17346902592107, 208.38, 'X[1] <= 0.415\ngini = 0.457\nsamples = 17\nvalue = [6,
 11]'),
 Text(359.2739619162441, 190.26, 'X[4] <= 0.316\ngini = 0.444\nsamples = 6\nvalue = [4,
 2]'),
 Text(358.3242083614056, 172.14, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(360.2237154710826, 172.14, 'X[1] <= 0.407\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(359.2739619162441, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(361.17346902592107, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(363.072976135598, 190.26, 'X[4] <= 0.312\ngini = 0.298\nsamples = 11\nvalue = [2,
 9]'),
 Text(362.12322258075955, 172.14, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(364.0227296904365, 172.14, 'X[3] <= 0.352\ngini = 0.5\nsamples = 4\nvalue = [2,
 2]'),
 Text(363.072976135598, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(364.972483245275, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(365.92223680011347, 208.38, 'X[2] <= 0.834\ngini = 0.105\nsamples = 18\nvalue = [1,
 17]'),
 Text(364.972483245275, 190.26, 'gini = 0.0\nsamples = 17\nvalue = [0, 17]'),
 Text(366.87199035495195, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(368.7714974646289, 226.49999999999997, 'X[0] <= 0.518\ngini = 0.48\nsamples = 5\nval
ue = [3, 2]'),
```

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 Text(367.8217439097904, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(369.7212510194674, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(367.10942874366157, 262.74, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(389.13183929647886, 298.98, 'X[1] <= 0.462\ngini = 0.398\nsamples = 179\nvalue = [13
0, 49]'),
 Text(377.9128754299493, 280.86, 'X[0] <= 0.583\ngini = 0.309\nsamples = 115\nvalue = [93,
 22]'),
 Text(372.57051168398283, 262.74, 'X[2] <= 0.302\ngini = 0.473\nsamples = 39\nvalue = [24,
 15]'),
 Text(371.62075812914435, 244.61999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(373.5202652388213, 244.61999999999998, 'X[4] <= 0.205\ngini = 0.397\nsamples = 33\nv
alue = [24, 9]'),
 Text(372.57051168398283, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(374.4700187936598, 226.49999999999997, 'X[4] <= 0.339\ngini = 0.375\nsamples = 32\nv
alue = [24, 8]'),
 Text(371.62075812914435, 208.38, 'X[3] <= 0.207\ngini = 0.208\nsamples = 17\nvalue = [15,
 2]'),
 Text(370.67100457430587, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(372.57051168398283, 190.26, 'X[4] <= 0.242\ngini = 0.117\nsamples = 16\nvalue = [15,
 1]'),
 Text(371.62075812914435, 172.14, 'X[4] <= 0.226\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(370.67100457430587, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(372.57051168398283, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(373.5202652388213, 172.14, 'gini = 0.0\nsamples = 13\nvalue = [13, 0]'),
 Text(377.31927945817523, 208.38, 'X[4] <= 0.41\ngini = 0.48\nsamples = 15\nvalue = [9,
 6]'),
 Text(376.36952590333675, 190.26, 'X[0] <= 0.562\ngini = 0.48\nsamples = 10\nvalue = [4,
 6]'),
 Text(375.41977234849827, 172.14, 'X[3] <= 0.252\ngini = 0.375\nsamples = 8\nvalue = [2,
 6]'),
 Text(374.4700187936598, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(376.36952590333675, 154.01999999999998, 'X[1] <= 0.44\ngini = 0.245\nsamples = 7\nva
lue = [1, 6]'),
 Text(375.41977234849827, 135.89999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(377.31927945817523, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(377.31927945817523, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(378.2690330130137, 190.26, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(383.25523917591573, 262.74, 'X[4] <= 0.211\ngini = 0.167\nsamples = 76\nvalue = [69,
 7]'),
 Text(380.1685401226907, 244.61999999999998, 'X[0] <= 0.594\ngini = 0.444\nsamples = 3\nva
lue = [1, 2]'),
 Text(379.2187865678522, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(381.11829367752915, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(386.3419382291408, 244.61999999999998, 'X[1] <= 0.32\ngini = 0.128\nsamples = 73\nva
lue = [68, 5]'),
 Text(383.0178007872061, 226.49999999999997, 'X[1] <= 0.315\ngini = 0.375\nsamples = 12\nv
alue = [9, 3]'),
 Text(381.11829367752915, 208.38, 'X[1] <= 0.294\ngini = 0.198\nsamples = 9\nvalue = [8,
 1]'),
 Text(380.1685401226907, 190.26, 'X[1] <= 0.29\ngini = 0.5\nsamples = 2\nvalue = [1, 1]'),
 Text(379.2187865678522, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(381.11829367752915, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(382.06804723236763, 190.26, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(384.9173078968831, 208.38, 'X[4] <= 0.348\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(383.9675543420446, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(385.86706145172155, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(389.6660756710755, 226.49999999999997, 'X[3] <= 0.316\ngini = 0.063\nsamples = 61\nv
alue = [59, 2]'),
 Text(388.716322116237, 208.38, 'X[3] <= 0.313\ngini = 0.245\nsamples = 14\nvalue = [12,
 2]'),
 Text(387.7665685613985, 190.26, 'X[1] <= 0.401\ngini = 0.142\nsamples = 13\nvalue = [12,
 1]'),
 Text(386.81681500656003, 172.14, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(388.716322116237, 172.14, 'X[1] <= 0.41\ngini = 0.444\nsamples = 3\nvalue = [2,
```

```
 1]'),
 Text(387.7665685613985, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(389.6660756710755, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(389.6660756710755, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(390.61582922591396, 208.38, 'gini = 0.0\nsamples = 47\nvalue = [47, 0]'),
 Text(400.3508031630084, 280.86, 'X[0] <= 0.796\ngini = 0.488\nsamples = 64\nvalue = [37,
 27]'),
 Text(399.4010496081699, 262.74, 'X[3] <= 0.432\ngini = 0.456\nsamples = 57\nvalue = [37,
 20]'),
 Text(396.7892273323641, 244.61999999999998, 'X[4] <= 0.227\ngini = 0.395\nsamples = 48\nv
alue = [35, 13]'),
 Text(395.8394737775256, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(397.73898088720256, 226.49999999999997, 'X[3] <= 0.373\ngini = 0.364\nsamples = 46\n
value = [35, 11]'),
 Text(395.36459700010636, 208.38, 'X[1] <= 0.575\ngini = 0.483\nsamples = 22\nvalue = [13,
 9]'),
 Text(394.4148434452679, 190.26, 'X[3] <= 0.359\ngini = 0.432\nsamples = 19\nvalue = [13,
 6]'),
 Text(392.5153363355909, 172.14, 'X[2] <= 0.74\ngini = 0.26\nsamples = 13\nvalue = [11,
 2]'),
 Text(391.56558278075244, 154.01999999999998, 'X[1] <= 0.485\ngini = 0.153\nsamples = 12\n
value = [11, 1]'),
 Text(390.61582922591396, 135.89999999999998, 'X[3] <= 0.333\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(389.6660756710755, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(391.56558278075244, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(392.5153363355909, 135.89999999999998, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(393.4650898904294, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(396.31435055494484, 172.14, 'X[1] <= 0.552\ngini = 0.444\nsamples = 6\nvalue = [2,
 4]'),
 Text(395.36459700010636, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(397.2641041097833, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(396.31435055494484, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(400.11336477429876, 208.38, 'X[1] <= 0.468\ngini = 0.153\nsamples = 24\nvalue = [22,
 2]'),
 Text(399.1636112194603, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(401.06311832913724, 190.26, 'X[4] <= 0.27\ngini = 0.083\nsamples = 23\nvalue = [22,
 1]'),
 Text(400.11336477429876, 172.14, 'X[3] <= 0.416\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(399.1636112194603, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(401.06311832913724, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(402.0128718839757, 172.14, 'gini = 0.0\nsamples = 20\nvalue = [20, 0]'),
 Text(402.0128718839757, 244.61999999999998, 'X[0] <= 0.551\ngini = 0.346\nsamples = 9\nva
lue = [2, 7]'),
 Text(401.06311832913724, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(402.9626254388142, 226.49999999999997, 'X[0] <= 0.74\ngini = 0.219\nsamples = 8\nval
ue = [1, 7]'),
 Text(402.0128718839757, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(403.9123789936527, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(401.30055671784686, 262.74, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(411.5104074323605, 317.1, 'X[3] <= 0.423\ngini = 0.263\nsamples = 45\nvalue = [7, 3
8]'),
 Text(410.56065387752204, 298.98, 'X[0] <= 0.795\ngini = 0.172\nsamples = 42\nvalue = [4,
 38]'),
 Text(409.61090032268356, 280.86, 'X[1] <= 0.657\ngini = 0.136\nsamples = 41\nvalue = [3,
 38]'),
 Text(408.6611467678451, 262.74, 'X[1] <= 0.65\ngini = 0.355\nsamples = 13\nvalue = [3, 1
0]'),
 Text(407.7113932130066, 244.61999999999998, 'X[4] <= 0.354\ngini = 0.165\nsamples = 11\nv
alue = [1, 10]'),
 Text(406.7616396581681, 226.49999999999997, 'X[4] <= 0.348\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(405.81188610332964, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(407.7113932130066, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(408.6611467678451, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [0, 9]'),
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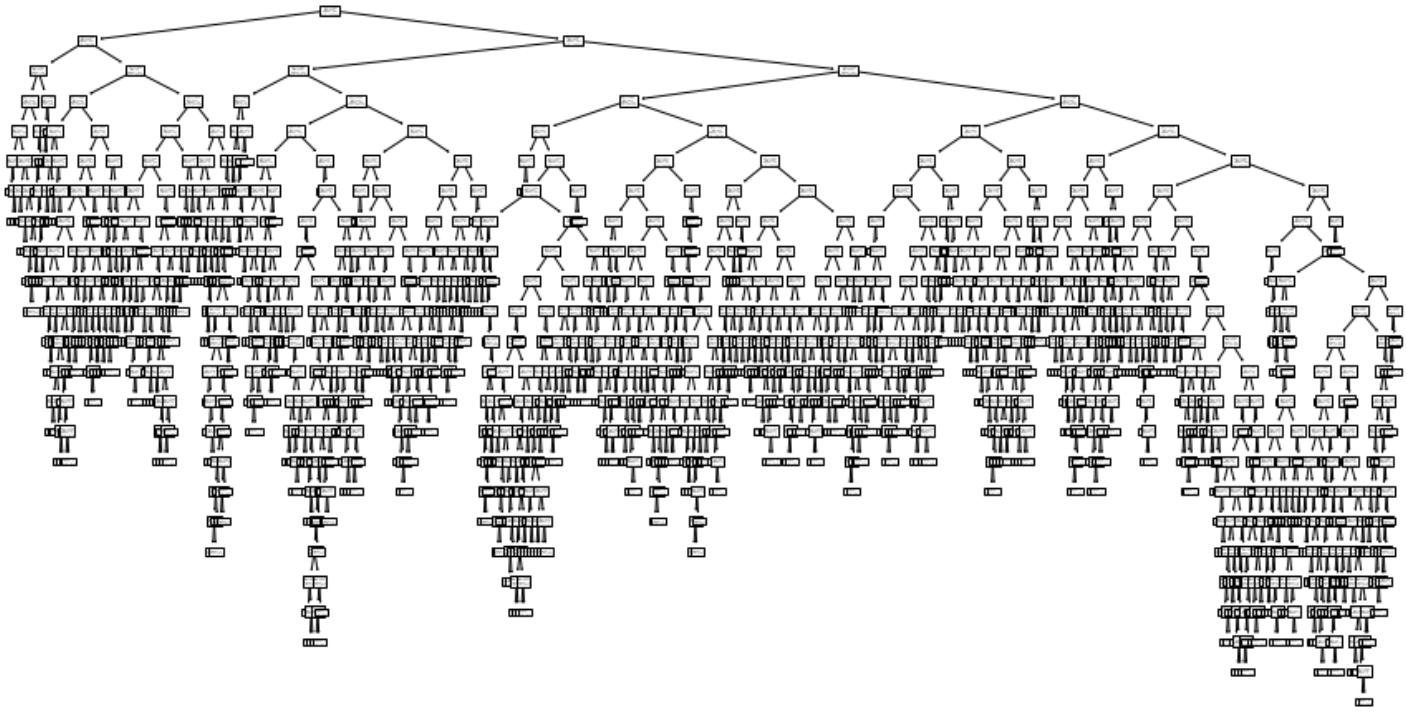
 Text(409.61090032268356, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(410.56065387752204, 262.74, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(411.5104074323605, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(412.460160987199, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(458.87194603028263, 335.21999999999997, 'X[0] <= 0.544\ngini = 0.292\nsamples = 745
\nvalue = [613, 132]'),
 Text(436.6788766355803, 317.1, 'X[3] <= 0.718\ngini = 0.468\nsamples = 155\nvalue = [97,
 58]'),
 Text(431.45523208396867, 298.98, 'X[4] <= 0.413\ngini = 0.45\nsamples = 143\nvalue = [94,
 49]'),
 Text(425.7567107549378, 280.86, 'X[1] <= 0.646\ngini = 0.432\nsamples = 136\nvalue = [93,
 43]'),
 Text(417.20892876139146, 262.74, 'X[1] <= 0.429\ngini = 0.474\nsamples = 96\nvalue = [59,
 37]'),
 Text(416.259175206553, 244.61999999999998, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(418.15868231622994, 244.61999999999998, 'X[4] <= 0.337\ngini = 0.486\nsamples = 89\n
value = [52, 37]'),
 Text(410.56065387752204, 226.49999999999997, 'X[3] <= 0.484\ngini = 0.5\nsamples = 55\nva
lue = [27, 28]'),
 Text(409.61090032268356, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(411.5104074323605, 208.38, 'X[4] <= 0.274\ngini = 0.495\nsamples = 49\nvalue = [27,
 22]'),
 Text(408.18626999042584, 190.26, 'X[1] <= 0.567\ngini = 0.393\nsamples = 26\nvalue = [19,
 7]'),
 Text(407.23651643558736, 172.14, 'gini = 0.0\nsamples = 13\nvalue = [13, 0]'),
 Text(409.1360235452643, 172.14, 'X[2] <= 0.295\ngini = 0.497\nsamples = 13\nvalue = [6,
 7]'),
 Text(408.18626999042584, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(410.0857771001028, 154.01999999999998, 'X[3] <= 0.668\ngini = 0.42\nsamples = 10\nva
lue = [3, 7]'),
 Text(409.1360235452643, 135.89999999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(411.0355306549413, 135.89999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(414.83454487429526, 190.26, 'X[3] <= 0.541\ngini = 0.454\nsamples = 23\nvalue = [8,
 15]'),
 Text(412.93503776461824, 172.14, 'X[1] <= 0.501\ngini = 0.5\nsamples = 14\nvalue = [7,
 7]'),
 Text(411.98528420977976, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(413.8847913194568, 154.01999999999998, 'X[4] <= 0.28\ngini = 0.42\nsamples = 10\nval
ue = [7, 3]'),
 Text(412.93503776461824, 135.89999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(414.83454487429526, 135.89999999999998, 'X[3] <= 0.505\ngini = 0.219\nsamples = 8\nv
alue = [7, 1]'),
 Text(413.8847913194568, 117.77999999999997, 'X[1] <= 0.554\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(412.93503776461824, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(414.83454487429526, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(415.78429842913374, 117.77999999999997, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(416.7340519839722, 172.14, 'X[2] <= 0.767\ngini = 0.198\nsamples = 9\nvalue = [1,
 8]'),
 Text(415.78429842913374, 154.01999999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(417.6838055388107, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(425.7567107549378, 226.49999999999997, 'X[0] <= 0.534\ngini = 0.389\nsamples = 34\nv
alue = [25, 9]'),
 Text(423.3823268678416, 208.38, 'X[1] <= 0.457\ngini = 0.293\nsamples = 28\nvalue = [23,
 5]'),
 Text(421.4828197581646, 190.26, 'X[4] <= 0.371\ngini = 0.5\nsamples = 6\nvalue = [3,
 3]'),
 Text(420.53306620332614, 172.14, 'X[2] <= 0.612\ngini = 0.375\nsamples = 4\nvalue = [1,
 3]'),
 Text(419.58331264848766, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(421.4828197581646, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(422.4325733130031, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(425.28183397751854, 190.26, 'X[2] <= 0.164\ngini = 0.165\nsamples = 22\nvalue = [20,
 2]'),
 Text(424.33208042268006, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(426.231587532357, 172.14, 'X[2] <= 0.77\ngini = 0.091\nsamples = 21\nvalue = [20,
```

```
 1]'),
 Text(425.28183397751854, 154.01999999999998, 'gini = 0.0\nsamples = 19\nvalue = [19,
 0]'),
 Text(427.1813410871955, 154.01999999999998, 'X[1] <= 0.537\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(426.231587532357, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(428.131094642034, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(428.131094642034, 208.38, 'X[1] <= 0.521\ngini = 0.444\nsamples = 6\nvalue = [2,
 4]'),
 Text(427.1813410871955, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(429.08084819687247, 190.26, 'X[4] <= 0.343\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(428.131094642034, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(430.03060175171095, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(434.3044927484841, 262.74, 'X[4] <= 0.208\ngini = 0.255\nsamples = 40\nvalue = [34,
 6]'),
 Text(431.9301088613879, 244.61999999999998, 'X[4] <= 0.193\ngini = 0.48\nsamples = 5\nval
ue = [2, 3]'),
 Text(430.9803553065494, 226.49999999999997, 'X[2] <= 0.469\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(430.03060175171095, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(431.9301088613879, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(432.8798624162264, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(436.6788766355803, 244.61999999999998, 'X[3] <= 0.692\ngini = 0.157\nsamples = 35\nv
alue = [32, 3]'),
 Text(434.77936952590335, 226.49999999999997, 'X[2] <= 0.232\ngini = 0.062\nsamples = 31\n
value = [30, 1]'),
 Text(433.82961597106487, 208.38, 'X[3] <= 0.637\ngini = 0.5\nsamples = 2\nvalue = [1,
 1]'),
 Text(432.8798624162264, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(434.77936952590335, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(435.72912308074183, 208.38, 'gini = 0.0\nsamples = 29\nvalue = [29, 0]'),
 ...]
```



Jednotlivé stromy budeme vždy exportovať do dot formátu. Zo súborov následne vytvoríme vizualizáciu pomocou nástroja Graphviz dostupného aj online na https://dreampuf.github.io/GraphvizOnline/

Obrázky budú uložené v priečinku *images*.

In [140…

```
dotfile = open("data/decision_tree_basic.dot", 'w')
tree.export_graphviz(clf0, out_file = dotfile, feature_names = xtrain.columns)
```

```
dotfile.close()
```

Natrénovaný klasifikátor spraví predikciu na našu testovaciu množinu dát a následne sa pozrieme akú úspešnosť pri klasifikácii dát dosiahol.

In [21]:
```
ypred0 = clf0.predict(xtest)
```

In [22]:
```
acc = metrics.accuracy_score(ytest, ypred0)
print("Accuracy :", acc * 100, '%')
```

```
Accuracy : 78.95161290322581 %
```

In [23]:
```
prec = metrics.precision_score(ytest, ypred0)
print("Precision :", prec * 100, '%')
```

```
Precision : 83.11688311688312 %
```

In [24]:
```
rec = metrics.recall_score(ytest, ypred0)
print("Recall :", rec * 100, '%')
```

```
Recall : 84.36911487758945 %
```

Podľa výsledkov vidíme, že takýto klasifikátor s predvolenými hodnotami hyperparamtrov dosiahol dobrú úspešnosť.

Oproti nami vytvorenému One-R klasifikátoru dosiahol tento rozhodovací strom vyššiu accuracy aj precision, avšak recall dosiahol menší.

In [25]:
```
algorithm_accuracy = algorithm_accuracy.append({'algorithm':'basic decision tree', 'accura
```

3. Optimalizácia - hyperparameter tuning

Pre dosianutie lepších výsledkov, teda vyššej presnosti klasifikácie dát sa v tejto časti pozrieme na niekoľko možných hyperparametrov pre nami zvolený algoritmus rozhodovacieho stromu. Najlepšiu kombináciu hyperparametrov nájdeme pomocou grid search algoritmu a úspešnosť vyhodnotíme pomocou 5 násobnej cross-validation.

Decision tree - manuálne skúšanie rôznych hyperparametrov

Nastavenia hodnoty hyperparametrov sú nami nájdené hodnoty, ktoré pri skúšaní rôznych hodnôt vyšli najúspešnejšie.

Vytvoríme si dataframe do ktorého si budeme ukladať kombinácie hyperparametrov decision trees s ich úspešnosťou.

In [26]:
```
hyperparameters = pd.DataFrame(columns=['hyperparameters', 'accuracy'])
```

max_depth

Nastavením tohto hyperparametra sa zastaví ďalšie delenie stromu po dosiahnutí hĺbky zadanej v hodnote tohto parametra.

In [27]:
```
clf1 = tree.DecisionTreeClassifier(max_depth=8)
clf1 = clf1.fit(xtrain, ytrain)
```

```
plt.figure(figsize=(15,8))
tree.plot_tree(clf1)
```

Out[27]:

```
[Text(306.31507120253167, 410.71999999999997, 'X[1] <= 0.287\ngini = 0.458\nsamples = 7438
\nvalue = [2636, 4802]'),
 Text(117.20648734177216, 362.4, 'X[0] <= 0.439\ngini = 0.409\nsamples = 1370\nvalue = [97
8, 392]'),
 Text(52.75395569620253, 314.08, 'X[3] <= 0.391\ngini = 0.168\nsamples = 194\nvalue = [18,
176]'),
 Text(38.40664556962025, 265.76, 'X[0] <= 0.417\ngini = 0.122\nsamples = 184\nvalue = [12,
172]'),
 Text(20.306962025316455, 217.44, 'X[4] <= 0.309\ngini = 0.071\nsamples = 162\nvalue = [6,
156]'),
 Text(10.59493670886076, 169.12, 'X[1] <= 0.242\ngini = 0.48\nsamples = 5\nvalue = [2,
3]'),
 Text(7.063291139240507, 120.80000000000001, 'X[0] <= 0.259\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(3.5316455696202533, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(10.59493670886076, 72.48000000000002, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(14.126582278481013, 120.80000000000001, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(30.018987341772153, 169.12, 'X[2] <= 0.035\ngini = 0.05\nsamples = 157\nvalue = [4,
153]'),
 Text(21.18987341772152, 120.80000000000001, 'X[4] <= 0.451\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(17.658227848101266, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(24.721518987341774, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(38.848101265822784, 120.80000000000001, 'X[4] <= 0.363\ngini = 0.038\nsamples = 155
\nvalue = [3, 152]'),
 Text(31.78481012658228, 72.48000000000002, 'X[4] <= 0.36\ngini = 0.219\nsamples = 8\nvalu
e = [1, 7]'),
 Text(28.253164556962027, 24.159999999999968, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(35.31645569620253, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(45.911392405063296, 72.48000000000002, 'X[4] <= 0.627\ngini = 0.027\nsamples = 147\n
value = [2, 145]'),
 Text(42.37974683544304, 24.159999999999968, 'gini = 0.015\nsamples = 136\nvalue = [1, 13
5]'),
 Text(49.44303797468355, 24.159999999999968, 'gini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(56.50632911392405, 217.44, 'X[4] <= 0.475\ngini = 0.397\nsamples = 22\nvalue = [6, 1
6]'),
 Text(52.9746835443038, 169.12, 'X[4] <= 0.344\ngini = 0.48\nsamples = 15\nvalue = [6,
9]'),
 Text(49.44303797468355, 120.80000000000001, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(56.50632911392405, 120.80000000000001, 'X[2] <= 0.238\ngini = 0.496\nsamples = 11\nv
alue = [6, 5]'),
 Text(52.9746835443038, 72.48000000000002, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(60.037974683544306, 72.48000000000002, 'X[3] <= 0.112\ngini = 0.444\nsamples = 9\nva
lue = [6, 3]'),
 Text(56.50632911392405, 24.159999999999968, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(63.56962025316456, 24.159999999999968, 'gini = 0.245\nsamples = 7\nvalue = [6, 1]'),
 Text(60.037974683544306, 169.12, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(67.10126582278481, 265.76, 'X[0] <= 0.378\ngini = 0.48\nsamples = 10\nvalue = [6,
4]'),
 Text(63.56962025316456, 217.44, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(70.63291139240506, 217.44, 'X[4] <= 0.532\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(67.10126582278481, 169.12, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(74.16455696202532, 169.12, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(181.65901898734177, 314.08, 'X[1] <= 0.206\ngini = 0.3\nsamples = 1176\nvalue = [96
0, 216]'),
 Text(116.9857594936709, 265.76, 'X[0] <= 0.528\ngini = 0.179\nsamples = 675\nvalue = [60
8, 67]'),
 Text(90.05696202531647, 217.44, 'X[4] <= 0.499\ngini = 0.465\nsamples = 49\nvalue = [31,
18]'),
 Text(81.22784810126582, 169.12, 'X[3] <= 0.157\ngini = 0.257\nsamples = 33\nvalue = [28,
```

```
5]'),
 Text(74.16455696202532, 120.80000000000001, 'X[2] <= 0.287\ngini = 0.32\nsamples = 5\nval
ue = [1, 4]'),
 Text(70.63291139240506, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(77.69620253164557, 72.48000000000002, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(88.29113924050634, 120.80000000000001, 'X[2] <= 0.174\ngini = 0.069\nsamples = 28\nv
alue = [27, 1]'),
 Text(84.75949367088609, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(91.82278481012659, 72.48000000000002, 'gini = 0.0\nsamples = 27\nvalue = [27, 0]'),
 Text(98.8860759493671, 169.12, 'X[3] <= 0.413\ngini = 0.305\nsamples = 16\nvalue = [3, 1
3]'),
 Text(95.35443037974684, 120.80000000000001, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(102.41772151898735, 120.80000000000001, 'X[4] <= 0.704\ngini = 0.375\nsamples = 4\nv
alue = [3, 1]'),
 Text(98.8860759493671, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(105.9493670886076, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(143.91455696202533, 217.44, 'X[0] <= 0.837\ngini = 0.144\nsamples = 626\nvalue = [57
7, 49]'),
 Text(128.90506329113924, 169.12, 'X[4] <= 0.804\ngini = 0.109\nsamples = 569\nvalue = [53
6, 33]'),
 Text(120.07594936708861, 120.80000000000001, 'X[4] <= 0.67\ngini = 0.095\nsamples = 561\n
value = [533, 28]'),
 Text(113.0126582278481, 72.48000000000002, 'X[0] <= 0.805\ngini = 0.051\nsamples = 458\nv
alue = [446, 12]'),
 Text(109.48101265822785, 24.159999999999968, 'gini = 0.04\nsamples = 437\nvalue = [428,
9]'),
 Text(116.54430379746836, 24.159999999999968, 'gini = 0.245\nsamples = 21\nvalue = [18,
3]'),
 Text(127.13924050632912, 72.48000000000002, 'X[3] <= 0.595\ngini = 0.262\nsamples = 103\n
value = [87, 16]'),
 Text(123.60759493670886, 24.159999999999968, 'gini = 0.473\nsamples = 13\nvalue = [5,
8]'),
 Text(130.67088607594937, 24.159999999999968, 'gini = 0.162\nsamples = 90\nvalue = [82,
8]'),
 Text(137.73417721518987, 120.80000000000001, 'X[0] <= 0.757\ngini = 0.469\nsamples = 8\nv
alue = [3, 5]'),
 Text(134.20253164556962, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(141.26582278481013, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(158.9240506329114, 169.12, 'X[2] <= 0.458\ngini = 0.404\nsamples = 57\nvalue = [41,
16]'),
 Text(151.86075949367088, 120.80000000000001, 'X[4] <= 0.704\ngini = 0.499\nsamples = 19\n
value = [9, 10]'),
 Text(148.32911392405063, 72.48000000000002, 'X[3] <= 0.466\ngini = 0.408\nsamples = 14\nv
alue = [4, 10]'),
 Text(144.79746835443038, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(151.86075949367088, 24.159999999999968, 'gini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(155.39240506329114, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(165.9873417721519, 120.80000000000001, 'X[1] <= 0.197\ngini = 0.266\nsamples = 38\nv
alue = [32, 6]'),
 Text(162.45569620253164, 72.48000000000002, 'X[2] <= 0.88\ngini = 0.234\nsamples = 37\nva
lue = [32, 5]'),
 Text(158.9240506329114, 24.159999999999968, 'gini = 0.198\nsamples = 36\nvalue = [32,
4]'),
 Text(165.9873417721519, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(169.51898734177217, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(246.33227848101268, 265.76, 'X[4] <= 0.644\ngini = 0.418\nsamples = 501\nvalue = [35
2, 149]'),
 Text(212.78164556962025, 217.44, 'X[0] <= 0.698\ngini = 0.333\nsamples = 355\nvalue = [28
0, 75]'),
 Text(196.00632911392407, 169.12, 'X[0] <= 0.508\ngini = 0.252\nsamples = 284\nvalue = [24
2, 42]'),
 Text(183.64556962025318, 120.80000000000001, 'X[3] <= 0.321\ngini = 0.468\nsamples = 75\n
value = [47, 28]'),
 Text(176.58227848101268, 72.48000000000002, 'X[1] <= 0.237\ngini = 0.476\nsamples = 41\nv
alue = [16, 25]'),
```

```
 Text(173.05063291139243, 24.159999999999968, 'gini = 0.219\nsamples = 16\nvalue = [2, 1
4]'),
 Text(180.11392405063293, 24.159999999999968, 'gini = 0.493\nsamples = 25\nvalue = [14, 1
1]'),
 Text(190.7088607594937, 72.48000000000002, 'X[2] <= 0.836\ngini = 0.161\nsamples = 34\nva
lue = [31, 3]'),
 Text(187.17721518987344, 24.159999999999968, 'gini = 0.114\nsamples = 33\nvalue = [31,
2]'),
 Text(194.24050632911394, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(208.36708860759495, 120.80000000000001, 'X[1] <= 0.287\ngini = 0.125\nsamples = 209
\nvalue = [195, 14]'),
 Text(204.8354430379747, 72.48000000000002, 'X[4] <= 0.521\ngini = 0.117\nsamples = 208\nv
alue = [195, 13]'),
 Text(201.30379746835445, 24.159999999999968, 'gini = 0.214\nsamples = 82\nvalue = [72, 1
0]'),
 Text(208.36708860759495, 24.159999999999968, 'gini = 0.046\nsamples = 126\nvalue = [123,
3]'),
 Text(211.8987341772152, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(229.55696202531647, 169.12, 'X[4] <= 0.517\ngini = 0.498\nsamples = 71\nvalue = [38,
33]'),
 Text(222.49367088607596, 120.80000000000001, 'X[0] <= 0.969\ngini = 0.184\nsamples = 39\n
value = [35, 4]'),
 Text(218.9620253164557, 72.48000000000002, 'X[3] <= 0.637\ngini = 0.145\nsamples = 38\nva
lue = [35, 3]'),
 Text(215.43037974683546, 24.159999999999968, 'gini = 0.059\nsamples = 33\nvalue = [32,
1]'),
 Text(222.49367088607596, 24.159999999999968, 'gini = 0.48\nsamples = 5\nvalue = [3, 2]'),
 Text(226.0253164556962, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(236.62025316455697, 120.80000000000001, 'X[3] <= 0.295\ngini = 0.17\nsamples = 32\nv
alue = [3, 29]'),
 Text(233.08860759493672, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(240.15189873417722, 72.48000000000002, 'gini = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(279.88291139240505, 217.44, 'X[3] <= 0.603\ngini = 0.5\nsamples = 146\nvalue = [72,
74]'),
 Text(259.57594936708864, 169.12, 'X[0] <= 0.687\ngini = 0.412\nsamples = 62\nvalue = [18,
44]'),
 Text(250.74683544303798, 120.80000000000001, 'X[4] <= 0.67\ngini = 0.114\nsamples = 33\nv
alue = [2, 31]'),
 Text(247.21518987341773, 72.48000000000002, 'X[3] <= 0.539\ngini = 0.48\nsamples = 5\nval
ue = [2, 3]'),
 Text(243.68354430379748, 24.159999999999968, 'gini = 0.444\nsamples = 3\nvalue = [2,
1]'),
 Text(250.74683544303798, 24.159999999999968, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(254.27848101265823, 72.48000000000002, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(268.40506329113924, 120.80000000000001, 'X[2] <= 0.398\ngini = 0.495\nsamples = 29\n
value = [16, 13]'),
 Text(261.34177215189874, 72.48000000000002, 'X[2] <= 0.163\ngini = 0.32\nsamples = 10\nva
lue = [2, 8]'),
 Text(257.8101265822785, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(264.873417721519, 24.159999999999968, 'gini = 0.198\nsamples = 9\nvalue = [1, 8]'),
 Text(275.46835443037975, 72.48000000000002, 'X[4] <= 0.682\ngini = 0.388\nsamples = 19\nv
alue = [14, 5]'),
 Text(271.9367088607595, 24.159999999999968, 'gini = 0.5\nsamples = 8\nvalue = [4, 4]'),
 Text(279.0, 24.159999999999968, 'gini = 0.165\nsamples = 11\nvalue = [10, 1]'),
 Text(300.1898734177215, 169.12, 'X[0] <= 0.825\ngini = 0.459\nsamples = 84\nvalue = [54,
30]'),
 Text(296.65822784810126, 120.80000000000001, 'X[4] <= 0.856\ngini = 0.444\nsamples = 81\n
value = [54, 27]'),
 Text(289.59493670886076, 72.48000000000002, 'X[4] <= 0.811\ngini = 0.429\nsamples = 77\nv
alue = [53, 24]'),
 Text(286.0632911392405, 24.159999999999968, 'gini = 0.448\nsamples = 71\nvalue = [47, 2
4]'),
 Text(293.126582278481, 24.159999999999968, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(303.72151898734177, 72.48000000000002, 'X[0] <= 0.46\ngini = 0.375\nsamples = 4\nval
ue = [1, 3]'),
 Text(300.1898734177215, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
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 Text(307.253164556962, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(303.72151898734177, 120.80000000000001, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(495.42365506329116, 362.4, 'X[0] <= 0.405\ngini = 0.397\nsamples = 6068\nvalue = [16
58, 4410]'),
 Text(366.1875, 314.08, 'X[3] <= 0.193\ngini = 0.189\nsamples = 1996\nvalue = [211, 178
5]'),
 Text(330.2088607594937, 265.76, 'X[1] <= 0.634\ngini = 0.427\nsamples = 55\nvalue = [38,
17]'),
 Text(321.37974683544303, 217.44, 'X[4] <= 0.356\ngini = 0.273\nsamples = 43\nvalue = [36,
7]'),
 Text(314.3164556962025, 169.12, 'X[0] <= 0.289\ngini = 0.408\nsamples = 7\nvalue = [2,
5]'),
 Text(310.7848101265823, 120.80000000000001, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(317.8481012658228, 120.80000000000001, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(328.44303797468353, 169.12, 'X[4] <= 0.468\ngini = 0.105\nsamples = 36\nvalue = [34,
2]'),
 Text(324.9113924050633, 120.80000000000001, 'gini = 0.0\nsamples = 26\nvalue = [26, 0]'),
 Text(331.9746835443038, 120.80000000000001, 'X[2] <= 0.843\ngini = 0.32\nsamples = 10\nva
lue = [8, 2]'),
 Text(328.44303797468353, 72.48000000000002, 'X[4] <= 0.484\ngini = 0.198\nsamples = 9\nva
lue = [8, 1]'),
 Text(324.9113924050633, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(331.9746835443038, 24.159999999999968, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(335.50632911392404, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(339.03797468354435, 217.44, 'X[3] <= 0.186\ngini = 0.278\nsamples = 12\nvalue = [2,
10]'),
 Text(335.50632911392404, 169.12, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(342.5696202531646, 169.12, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(402.16613924050637, 265.76, 'X[4] <= 0.374\ngini = 0.162\nsamples = 1941\nvalue = [1
73, 1768]'),
 Text(369.9398734177215, 217.44, 'X[0] <= 0.3\ngini = 0.093\nsamples = 1209\nvalue = [59,
1150]'),
 Text(358.4620253164557, 169.12, 'X[3] <= 0.97\ngini = 0.048\nsamples = 572\nvalue = [14,
558]'),
 Text(349.6329113924051, 120.80000000000001, 'X[1] <= 0.759\ngini = 0.045\nsamples = 570\n
value = [13, 557]'),
 Text(342.5696202531646, 72.48000000000002, 'X[4] <= 0.089\ngini = 0.025\nsamples = 480\nv
alue = [6, 474]'),
 Text(339.03797468354435, 24.159999999999968, 'gini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(346.10126582278485, 24.159999999999968, 'gini = 0.021\nsamples = 477\nvalue = [5, 47
2]'),
 Text(356.6962025316456, 72.48000000000002, 'X[3] <= 0.599\ngini = 0.143\nsamples = 90\nva
lue = [7, 83]'),
 Text(353.16455696202536, 24.159999999999968, 'gini = 0.375\nsamples = 4\nvalue = [3,
1]'),
 Text(360.22784810126586, 24.159999999999968, 'gini = 0.089\nsamples = 86\nvalue = [4, 8
2]'),
 Text(367.29113924050637, 120.80000000000001, 'X[0] <= 0.278\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(363.7594936708861, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(370.8227848101266, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(381.4177215189874, 169.12, 'X[0] <= 0.3\ngini = 0.131\nsamples = 637\nvalue = [45, 5
92]'),
 Text(377.8860759493671, 120.80000000000001, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(384.94936708860763, 120.80000000000001, 'X[3] <= 0.578\ngini = 0.129\nsamples = 636
\nvalue = [44, 592]'),
 Text(377.8860759493671, 72.48000000000002, 'X[1] <= 0.73\ngini = 0.179\nsamples = 342\nva
lue = [34, 308]'),
 Text(374.3544303797469, 24.159999999999968, 'gini = 0.157\nsamples = 337\nvalue = [29, 30
8]'),
 Text(381.4177215189874, 24.159999999999968, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(392.01265822784814, 72.48000000000002, 'X[1] <= 0.89\ngini = 0.066\nsamples = 294\nv
alue = [10, 284]'),
 Text(388.4810126582279, 24.159999999999968, 'gini = 0.049\nsamples = 280\nvalue = [7, 27
3]'),
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 Text(395.5443037974684, 24.159999999999968, 'gini = 0.337\nsamples = 14\nvalue = [3, 1
1]'),
 Text(434.39240506329116, 217.44, 'X[1] <= 0.513\ngini = 0.263\nsamples = 732\nvalue = [11
4, 618]'),
 Text(411.4367088607595, 169.12, 'X[3] <= 0.237\ngini = 0.187\nsamples = 441\nvalue = [46,
395]'),
 Text(402.6075949367089, 120.80000000000001, 'X[3] <= 0.2\ngini = 0.473\nsamples = 13\nval
ue = [8, 5]'),
 Text(399.07594936708864, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(406.13924050632914, 72.48000000000002, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(420.26582278481015, 120.80000000000001, 'X[0] <= 0.325\ngini = 0.162\nsamples = 428
\nvalue = [38, 390]'),
 Text(413.20253164556965, 72.48000000000002, 'X[2] <= 0.737\ngini = 0.094\nsamples = 242\n
value = [12, 230]'),
 Text(409.6708860759494, 24.159999999999968, 'gini = 0.054\nsamples = 215\nvalue = [6, 20
9]'),
 Text(416.7341772151899, 24.159999999999968, 'gini = 0.346\nsamples = 27\nvalue = [6, 2
1]'),
 Text(427.32911392405066, 72.48000000000002, 'X[4] <= 0.456\ngini = 0.24\nsamples = 186\nv
alue = [26, 160]'),
 Text(423.7974683544304, 24.159999999999968, 'gini = 0.124\nsamples = 90\nvalue = [6, 8
4]'),
 Text(430.8607594936709, 24.159999999999968, 'gini = 0.33\nsamples = 96\nvalue = [20, 7
6]'),
 Text(457.34810126582283, 169.12, 'X[4] <= 0.604\ngini = 0.358\nsamples = 291\nvalue = [6
8, 223]'),
 Text(448.5189873417722, 120.80000000000001, 'X[3] <= 0.513\ngini = 0.454\nsamples = 184\n
value = [64, 120]'),
 Text(441.45569620253167, 72.48000000000002, 'X[1] <= 0.755\ngini = 0.441\nsamples = 73\nv
alue = [49, 24]'),
 Text(437.9240506329114, 24.159999999999968, 'gini = 0.282\nsamples = 53\nvalue = [44,
9]'),
 Text(444.9873417721519, 24.159999999999968, 'gini = 0.375\nsamples = 20\nvalue = [5, 1
5]'),
 Text(455.5822784810127, 72.48000000000002, 'X[1] <= 0.671\ngini = 0.234\nsamples = 111\nv
alue = [15, 96]'),
 Text(452.0506329113924, 24.159999999999968, 'gini = 0.112\nsamples = 84\nvalue = [5, 7
9]'),
 Text(459.11392405063293, 24.159999999999968, 'gini = 0.466\nsamples = 27\nvalue = [10, 1
7]'),
 Text(466.17721518987344, 120.80000000000001, 'X[2] <= 0.113\ngini = 0.072\nsamples = 107
\nvalue = [4, 103]'),
 Text(462.6455696202532, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(469.7088607594937, 72.48000000000002, 'X[0] <= 0.253\ngini = 0.055\nsamples = 106\nv
alue = [3, 103]'),
 Text(466.17721518987344, 24.159999999999968, 'gini = 0.444\nsamples = 6\nvalue = [2,
4]'),
 Text(473.24050632911394, 24.159999999999968, 'gini = 0.02\nsamples = 100\nvalue = [1, 9
9]'),
 Text(624.6598101265823, 314.08, 'X[4] <= 0.426\ngini = 0.458\nsamples = 4072\nvalue = [14
47, 2625]'),
 Text(525.3322784810127, 265.76, 'X[0] <= 0.485\ngini = 0.475\nsamples = 1473\nvalue = [90
0, 573]'),
 Text(490.01582278481015, 217.44, 'X[3] <= 0.197\ngini = 0.403\nsamples = 447\nvalue = [12
5, 322]'),
 Text(480.30379746835445, 169.12, 'X[1] <= 0.307\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(476.7721518987342, 120.80000000000001, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(483.8354430379747, 120.80000000000001, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(499.72784810126586, 169.12, 'X[1] <= 0.866\ngini = 0.395\nsamples = 440\nvalue = [11
9, 321]'),
 Text(490.8987341772152, 120.80000000000001, 'X[4] <= 0.235\ngini = 0.387\nsamples = 434\n
value = [114, 320]'),
 Text(483.8354430379747, 72.48000000000002, 'X[1] <= 0.412\ngini = 0.233\nsamples = 89\nva
lue = [12, 77]'),
 Text(480.30379746835445, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
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 Text(487.36708860759495, 24.159999999999968, 'gini = 0.187\nsamples = 86\nvalue = [9, 7
7]'),
 Text(497.9620253164557, 72.48000000000002, 'X[1] <= 0.682\ngini = 0.416\nsamples = 345\nv
alue = [102, 243]'),
 Text(494.43037974683546, 24.159999999999968, 'gini = 0.382\nsamples = 303\nvalue = [78, 2
25]'),
 Text(501.49367088607596, 24.159999999999968, 'gini = 0.49\nsamples = 42\nvalue = [24, 1
8]'),
 Text(508.55696202531647, 120.80000000000001, 'X[1] <= 0.934\ngini = 0.278\nsamples = 6\nv
alue = [5, 1]'),
 Text(505.0253164556962, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(512.0886075949368, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(560.6487341772153, 217.44, 'X[3] <= 0.449\ngini = 0.37\nsamples = 1026\nvalue = [77
5, 251]'),
 Text(538.5759493670886, 169.12, 'X[1] <= 0.617\ngini = 0.488\nsamples = 281\nvalue = [16
2, 119]'),
 Text(526.2151898734178, 120.80000000000001, 'X[0] <= 0.525\ngini = 0.451\nsamples = 236\n
value = [155, 81]'),
 Text(519.1518987341773, 72.48000000000002, 'X[0] <= 0.49\ngini = 0.492\nsamples = 57\nval
ue = [25, 32]'),
 Text(515.620253164557, 24.159999999999968, 'gini = 0.298\nsamples = 11\nvalue = [9, 2]'),
 Text(522.6835443037975, 24.159999999999968, 'gini = 0.454\nsamples = 46\nvalue = [16, 3
0]'),
 Text(533.2784810126583, 72.48000000000002, 'X[1] <= 0.462\ngini = 0.398\nsamples = 179\nv
alue = [130, 49]'),
 Text(529.746835443038, 24.159999999999968, 'gini = 0.309\nsamples = 115\nvalue = [93, 2
2]'),
 Text(536.8101265822785, 24.159999999999968, 'gini = 0.488\nsamples = 64\nvalue = [37, 2
7]'),
 Text(550.9367088607595, 120.80000000000001, 'X[3] <= 0.423\ngini = 0.263\nsamples = 45\nv
alue = [7, 38]'),
 Text(547.4050632911393, 72.48000000000002, 'X[0] <= 0.795\ngini = 0.172\nsamples = 42\nva
lue = [4, 38]'),
 Text(543.873417721519, 24.159999999999968, 'gini = 0.136\nsamples = 41\nvalue = [3, 3
8]'),
 Text(550.9367088607595, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(554.4683544303798, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(582.7215189873418, 169.12, 'X[0] <= 0.544\ngini = 0.292\nsamples = 745\nvalue = [61
3, 132]'),
 Text(568.5949367088608, 120.80000000000001, 'X[3] <= 0.718\ngini = 0.468\nsamples = 155\n
value = [97, 58]'),
 Text(561.5316455696203, 72.48000000000002, 'X[4] <= 0.413\ngini = 0.45\nsamples = 143\nva
lue = [94, 49]'),
 Text(558.0, 24.159999999999968, 'gini = 0.432\nsamples = 136\nvalue = [93, 43]'),
 Text(565.0632911392405, 24.159999999999968, 'gini = 0.245\nsamples = 7\nvalue = [1, 6]'),
 Text(575.6582278481013, 72.48000000000002, 'X[1] <= 0.654\ngini = 0.375\nsamples = 12\nva
lue = [3, 9]'),
 Text(572.126582278481, 24.159999999999968, 'gini = 0.375\nsamples = 4\nvalue = [3, 1]'),
 Text(579.1898734177215, 24.159999999999968, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(596.8481012658228, 120.80000000000001, 'X[4] <= 0.367\ngini = 0.219\nsamples = 590\n
value = [516, 74]'),
 Text(589.7848101265823, 72.48000000000002, 'X[0] <= 0.577\ngini = 0.129\nsamples = 461\nv
alue = [429, 32]'),
 Text(586.253164556962, 24.159999999999968, 'gini = 0.355\nsamples = 52\nvalue = [40, 1
2]'),
 Text(593.3164556962025, 24.159999999999968, 'gini = 0.093\nsamples = 409\nvalue = [389, 2
0]'),
 Text(603.9113924050633, 72.48000000000002, 'X[0] <= 0.834\ngini = 0.439\nsamples = 129\nv
alue = [87, 42]'),
 Text(600.379746835443, 24.159999999999968, 'gini = 0.405\nsamples = 117\nvalue = [84, 3
3]'),
 Text(607.4430379746835, 24.159999999999968, 'gini = 0.375\nsamples = 12\nvalue = [3,
9]'),
 Text(723.9873417721519, 265.76, 'X[1] <= 0.386\ngini = 0.332\nsamples = 2599\nvalue = [54
7, 2052]'),
 Text(667.4810126582279, 217.44, 'X[0] <= 0.597\ngini = 0.473\nsamples = 677\nvalue = [26
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0, 417]'),
 Text(639.2278481012659, 169.12, 'X[4] <= 0.726\ngini = 0.482\nsamples = 316\nvalue = [18
8, 128]'),
 Text(625.1012658227849, 120.80000000000001, 'X[4] <= 0.492\ngini = 0.399\nsamples = 251\n
value = [182, 69]'),
 Text(618.0379746835443, 72.48000000000002, 'X[3] <= 0.224\ngini = 0.498\nsamples = 47\nva
lue = [22, 25]'),
 Text(614.506329113924, 24.159999999999968, 'gini = 0.0\nsamples = 11\nvalue = [11, 0]'),
 Text(621.5696202531645, 24.159999999999968, 'gini = 0.424\nsamples = 36\nvalue = [11, 2
5]'),
 Text(632.1645569620254, 72.48000000000002, 'X[4] <= 0.67\ngini = 0.338\nsamples = 204\nva
lue = [160, 44]'),
 Text(628.632911392405, 24.159999999999968, 'gini = 0.275\nsamples = 170\nvalue = [142, 2
8]'),
 Text(635.6962025316456, 24.159999999999968, 'gini = 0.498\nsamples = 34\nvalue = [18, 1
6]'),
 Text(653.3544303797469, 120.80000000000001, 'X[3] <= 0.795\ngini = 0.168\nsamples = 65\nv
alue = [6, 59]'),
 Text(646.2911392405064, 72.48000000000002, 'X[3] <= 0.305\ngini = 0.071\nsamples = 54\nva
lue = [2, 52]'),
 Text(642.7594936708861, 24.159999999999968, 'gini = 0.48\nsamples = 5\nvalue = [2, 3]'),
 Text(649.8227848101266, 24.159999999999968, 'gini = 0.0\nsamples = 49\nvalue = [0, 49]'),
 Text(660.4177215189874, 72.48000000000002, 'X[4] <= 0.742\ngini = 0.463\nsamples = 11\nva
lue = [4, 7]'),
 Text(656.8860759493671, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(663.9493670886076, 24.159999999999968, 'gini = 0.219\nsamples = 8\nvalue = [1, 7]'),
 Text(695.7341772151899, 169.12, 'X[4] <= 0.734\ngini = 0.319\nsamples = 361\nvalue = [72,
289]'),
 Text(681.6075949367089, 120.80000000000001, 'X[3] <= 0.393\ngini = 0.28\nsamples = 332\nv
alue = [56, 276]'),
 Text(674.5443037974684, 72.48000000000002, 'X[1] <= 0.335\ngini = 0.484\nsamples = 68\nva
lue = [28, 40]'),
 Text(671.0126582278481, 24.159999999999968, 'gini = 0.482\nsamples = 32\nvalue = [19, 1
3]'),
 Text(678.0759493670887, 24.159999999999968, 'gini = 0.375\nsamples = 36\nvalue = [9, 2
7]'),
 Text(688.6708860759494, 72.48000000000002, 'X[0] <= 0.652\ngini = 0.19\nsamples = 264\nva
lue = [28, 236]'),
 Text(685.1392405063292, 24.159999999999968, 'gini = 0.408\nsamples = 70\nvalue = [20, 5
0]'),
 Text(692.2025316455697, 24.159999999999968, 'gini = 0.079\nsamples = 194\nvalue = [8, 18
6]'),
 Text(709.8607594936709, 120.80000000000001, 'X[0] <= 0.627\ngini = 0.495\nsamples = 29\nv
alue = [16, 13]'),
 Text(702.7974683544304, 72.48000000000002, 'X[3] <= 0.785\ngini = 0.198\nsamples = 9\nval
ue = [1, 8]'),
 Text(699.2658227848102, 24.159999999999968, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(706.3291139240507, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(716.9240506329114, 72.48000000000002, 'X[4] <= 0.769\ngini = 0.375\nsamples = 20\nva
lue = [15, 5]'),
 Text(713.3924050632912, 24.159999999999968, 'gini = 0.496\nsamples = 11\nvalue = [6,
5]'),
 Text(720.4556962025317, 24.159999999999968, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(780.493670886076, 217.44, 'X[4] <= 0.472\ngini = 0.254\nsamples = 1922\nvalue = [28
7, 1635]'),
 Text(752.2405063291139, 169.12, 'X[1] <= 0.66\ngini = 0.435\nsamples = 238\nvalue = [76,
162]'),
 Text(738.1139240506329, 120.80000000000001, 'X[0] <= 0.662\ngini = 0.473\nsamples = 172\n
value = [66, 106]'),
 Text(731.0506329113924, 72.48000000000002, 'X[3] <= 0.442\ngini = 0.499\nsamples = 92\nva
lue = [48, 44]'),
 Text(727.5189873417722, 24.159999999999968, 'gini = 0.337\nsamples = 28\nvalue = [22,
6]'),
 Text(734.5822784810127, 24.159999999999968, 'gini = 0.482\nsamples = 64\nvalue = [26, 3
8]'),
 Text(745.1772151898734, 72.48000000000002, 'X[1] <= 0.423\ngini = 0.349\nsamples = 80\nva

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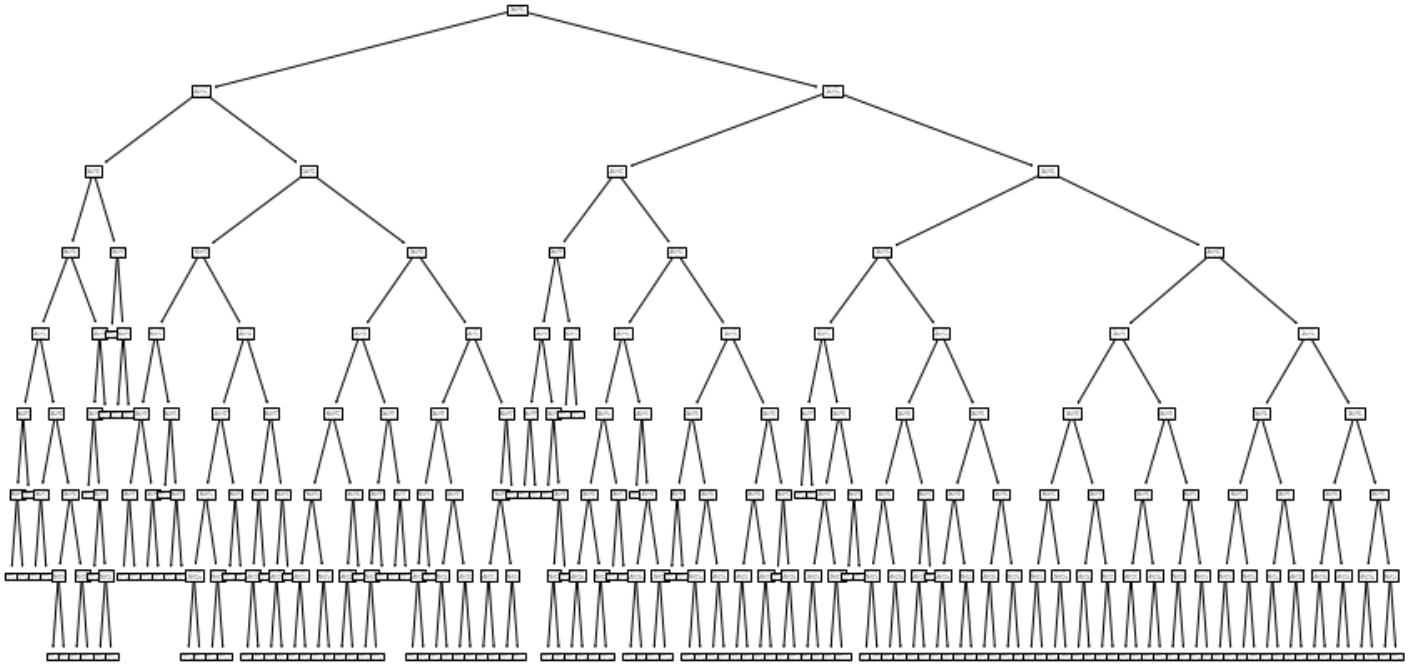
lue = [18, 62]'),
 Text(741.6455696202532, 24.159999999999968, 'gini = 0.469\nsamples = 8\nvalue = [5, 3]'),
 Text(748.7088607594937, 24.159999999999968, 'gini = 0.296\nsamples = 72\nvalue = [13, 5
9]'),
 Text(766.367088607595, 120.80000000000001, 'X[4] <= 0.43\ngini = 0.257\nsamples = 66\nval
ue = [10, 56]'),
 Text(759.3037974683544, 72.48000000000002, 'X[1] <= 0.689\ngini = 0.5\nsamples = 6\nvalue
= [3, 3]'),
 Text(755.7721518987343, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(762.8354430379748, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(773.4303797468355, 72.48000000000002, 'X[2] <= 0.125\ngini = 0.206\nsamples = 60\nva
lue = [7, 53]'),
 Text(769.8987341772153, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(776.9620253164558, 24.159999999999968, 'gini = 0.183\nsamples = 59\nvalue = [6, 5
3]'),
 Text(808.746835443038, 169.12, 'X[0] <= 0.527\ngini = 0.219\nsamples = 1684\nvalue = [21
1, 1473]'),
 Text(794.620253164557, 120.80000000000001, 'X[1] <= 0.476\ngini = 0.329\nsamples = 573\nv
alue = [119, 454]'),
 Text(787.5569620253165, 72.48000000000002, 'X[4] <= 0.667\ngini = 0.494\nsamples = 150\nv
alue = [67, 83]'),
 Text(784.0253164556963, 24.159999999999968, 'gini = 0.407\nsamples = 81\nvalue = [58, 2
3]'),
 Text(791.0886075949368, 24.159999999999968, 'gini = 0.227\nsamples = 69\nvalue = [9, 6
0]'),
 Text(801.6835443037975, 72.48000000000002, 'X[4] <= 0.496\ngini = 0.216\nsamples = 423\nv
alue = [52, 371]'),
 Text(798.1518987341773, 24.159999999999968, 'gini = 0.459\nsamples = 28\nvalue = [10, 1
8]'),
 Text(805.2151898734178, 24.159999999999968, 'gini = 0.19\nsamples = 395\nvalue = [42, 35
3]'),
 Text(822.873417721519, 120.80000000000001, 'X[4] <= 0.794\ngini = 0.152\nsamples = 1111\n
value = [92, 1019]'),
 Text(815.8101265822785, 72.48000000000002, 'X[3] <= 0.116\ngini = 0.145\nsamples = 1105\n
value = [87, 1018]'),
 Text(812.2784810126583, 24.159999999999968, 'gini = 0.496\nsamples = 11\nvalue = [5,
6]'),
 Text(819.3417721518988, 24.159999999999968, 'gini = 0.139\nsamples = 1094\nvalue = [82, 1
012]'),
 Text(829.9367088607595, 72.48000000000002, 'X[0] <= 0.572\ngini = 0.278\nsamples = 6\nval
ue = [5, 1]'),
 Text(826.4050632911393, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(833.4683544303798, 24.159999999999968, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]')]
```



In [141…
```
dotfile = open("data/tree_max_depth.dot", 'w')
tree.export_graphviz(clf1, out_file = dotfile, feature_names = xtrain.columns)
dotfile.close()
```

In [28]:
```
ypred1 = clf1.predict(xtest)
```

In [29]:
```
scores1 = cross_val_score(clf1, xtrain, ytrain, cv=5)
scores1
```

Out[29]:
```
array([0.84072581, 0.8266129 , 0.83602151, 0.84263618, 0.82918628])
```

In [30]:
```
print("%0.4f accuracy with a standard deviation of %0.4f" % (scores1.mean(), scores1.std()
```

```
0.8350 accuracy with a standard deviation of 0.0063
```

In [31]:
```
hyperparameters = hyperparameters.append({'hyperparameters':'max_depth', 'accuracy': score
```

gini

Nastavením kritéria na hyperparameter gini sa do rozhodovania vkladá "impurity", t.j. náhodne sa označí vybratý element stromu nesprávnym označením a toto označenie bolo tiež náhodné.

In [32]:
```
clf2 = tree.DecisionTreeClassifier(criterion='gini')
clf2 = clf2.fit(xtrain, ytrain)
plt.figure(figsize=(15,8))
tree.plot_tree(clf2)
```

Out[32]:
```
[Text(192.8974078634511, 425.82, 'X[1] <= 0.287\ngini = 0.458\nsamples = 7438\nvalue = [26
36, 4802]'),
 Text(45.241560990338165, 407.7, 'X[0] <= 0.439\ngini = 0.409\nsamples = 1370\nvalue = [97
8, 392]'),
 Text(15.784541062801932, 389.58, 'X[3] <= 0.391\ngini = 0.168\nsamples = 194\nvalue = [1
8, 176]'),
 Text(11.441545893719807, 371.46, 'X[0] <= 0.417\ngini = 0.122\nsamples = 184\nvalue = [1
```

```
2, 172]'),
 Text(5.630917874396135, 353.34, 'X[4] <= 0.309\ngini = 0.071\nsamples = 162\nvalue = [6,
156]'),
 Text(2.8753623188405797, 335.21999999999997, 'X[1] <= 0.242\ngini = 0.48\nsamples = 5\nva
lue = [2, 3]'),
 Text(1.9169082125603865, 317.1, 'X[4] <= 0.219\ngini = 0.444\nsamples = 3\nvalue = [2,
1]'),
 Text(0.9584541062801932, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(2.8753623188405797, 298.98, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(3.833816425120773, 317.1, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(8.38647342995169, 335.21999999999997, 'X[2] <= 0.035\ngini = 0.05\nsamples = 157\nva
lue = [4, 153]'),
 Text(5.750724637681159, 317.1, 'X[1] <= 0.256\ngini = 0.5\nsamples = 2\nvalue = [1, 1]'),
 Text(4.792270531400966, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(6.709178743961353, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(11.022222222222222, 317.1, 'X[4] <= 0.363\ngini = 0.038\nsamples = 155\nvalue = [3,
152]'),
 Text(8.626086956521739, 298.98, 'X[4] <= 0.36\ngini = 0.219\nsamples = 8\nvalue = [1,
7]'),
 Text(7.667632850241546, 280.86, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(9.584541062801932, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(13.418357487922705, 298.98, 'X[4] <= 0.627\ngini = 0.027\nsamples = 147\nvalue = [2,
145]'),
 Text(11.501449275362319, 280.86, 'X[2] <= 0.715\ngini = 0.015\nsamples = 136\nvalue = [1,
135]'),
 Text(10.542995169082126, 262.74, 'gini = 0.0\nsamples = 124\nvalue = [0, 124]'),
 Text(12.459903381642512, 262.74, 'X[2] <= 0.716\ngini = 0.153\nsamples = 12\nvalue = [1,
11]'),
 Text(11.501449275362319, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(13.418357487922705, 244.61999999999998, 'gini = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
 Text(15.335265700483092, 280.86, 'X[4] <= 0.628\ngini = 0.165\nsamples = 11\nvalue = [1,
10]'),
 Text(14.376811594202898, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(16.293719806763285, 262.74, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(17.252173913043478, 353.34, 'X[4] <= 0.475\ngini = 0.397\nsamples = 22\nvalue = [6,
16]'),
 Text(16.293719806763285, 335.21999999999997, 'X[4] <= 0.344\ngini = 0.48\nsamples = 15\nv
alue = [6, 9]'),
 Text(15.335265700483092, 317.1, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(17.252173913043478, 317.1, 'X[2] <= 0.238\ngini = 0.496\nsamples = 11\nvalue = [6,
5]'),
 Text(16.293719806763285, 298.98, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(18.21062801932367, 298.98, 'X[3] <= 0.112\ngini = 0.444\nsamples = 9\nvalue = [6,
3]'),
 Text(17.252173913043478, 280.86, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(19.169082125603865, 280.86, 'X[2] <= 0.689\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(18.21062801932367, 262.74, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(20.127536231884058, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(18.21062801932367, 335.21999999999997, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(20.127536231884058, 371.46, 'X[0] <= 0.378\ngini = 0.48\nsamples = 10\nvalue = [6,
4]'),
 Text(19.169082125603865, 353.34, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(21.08599033816425, 353.34, 'X[4] <= 0.532\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(20.127536231884058, 335.21999999999997, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(22.044444444444444, 335.21999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(74.6985809178744, 389.58, 'X[1] <= 0.206\ngini = 0.3\nsamples = 1176\nvalue = [960,
216]'),
 Text(39.848852657004834, 371.46, 'X[0] <= 0.528\ngini = 0.179\nsamples = 675\nvalue = [60
8, 67]'),
 Text(26.357487922705314, 353.34, 'X[4] <= 0.499\ngini = 0.465\nsamples = 49\nvalue = [31,
18]'),
 Text(23.96135265700483, 335.21999999999997, 'X[3] <= 0.157\ngini = 0.257\nsamples = 33\nv
alue = [28, 5]'),
```

```
 Text(22.044444444444444, 317.1, 'X[2] <= 0.287\ngini = 0.32\nsamples = 5\nvalue = [1,
4]'),
 Text(21.08599033816425, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(23.002898550724638, 298.98, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(25.878260869565217, 317.1, 'X[2] <= 0.174\ngini = 0.069\nsamples = 28\nvalue = [27,
1]'),
 Text(24.919806763285024, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(26.83671497584541, 298.98, 'gini = 0.0\nsamples = 27\nvalue = [27, 0]'),
 Text(28.753623188405797, 335.21999999999997, 'X[3] <= 0.413\ngini = 0.305\nsamples = 16\n
value = [3, 13]'),
 Text(27.795169082125604, 317.1, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(29.71207729468599, 317.1, 'X[2] <= 0.348\ngini = 0.375\nsamples = 4\nvalue = [3,
1]'),
 Text(28.753623188405797, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(30.670531400966183, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(53.34021739130435, 353.34, 'X[0] <= 0.837\ngini = 0.144\nsamples = 626\nvalue = [57
7, 49]'),
 Text(45.54903381642512, 335.21999999999997, 'X[4] <= 0.804\ngini = 0.109\nsamples = 569\n
value = [536, 33]'),
 Text(40.27004830917874, 317.1, 'X[4] <= 0.67\ngini = 0.095\nsamples = 561\nvalue = [533,
28]'),
 Text(32.58743961352657, 298.98, 'X[0] <= 0.805\ngini = 0.051\nsamples = 458\nvalue = [44
6, 12]'),
 Text(26.08792270531401, 280.86, 'X[3] <= 0.148\ngini = 0.04\nsamples = 437\nvalue = [428,
9]'),
 Text(22.314009661835748, 262.74, 'X[1] <= 0.165\ngini = 0.236\nsamples = 22\nvalue = [19,
3]'),
 Text(21.355555555555554, 244.61999999999998, 'gini = 0.0\nsamples = 15\nvalue = [15,
0]'),
 Text(23.27246376811594, 244.61999999999998, 'X[1] <= 0.169\ngini = 0.49\nsamples = 7\nval
ue = [4, 3]'),
 Text(22.314009661835748, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(24.230917874396134, 226.49999999999997, 'X[1] <= 0.2\ngini = 0.32\nsamples = 5\nvalu
e = [4, 1]'),
 Text(23.27246376811594, 208.38, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(25.189371980676327, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(29.86183574879227, 262.74, 'X[4] <= 0.207\ngini = 0.028\nsamples = 415\nvalue = [40
9, 6]'),
 Text(27.106280193236714, 244.61999999999998, 'X[3] <= 0.358\ngini = 0.375\nsamples = 4\nv
alue = [3, 1]'),
 Text(26.14782608695652, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(28.064734299516907, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(32.61739130434783, 244.61999999999998, 'X[1] <= 0.204\ngini = 0.024\nsamples = 411\n
value = [406, 5]'),
 Text(29.981642512077293, 226.49999999999997, 'X[2] <= 0.722\ngini = 0.02\nsamples = 405\n
value = [401, 4]'),
 Text(27.58550724637681, 208.38, 'X[3] <= 0.214\ngini = 0.011\nsamples = 347\nvalue = [34
5, 2]'),
 Text(25.668599033816424, 190.26, 'X[3] <= 0.206\ngini = 0.062\nsamples = 31\nvalue = [30,
1]'),
 Text(24.71014492753623, 172.14, 'gini = 0.0\nsamples = 30\nvalue = [30, 0]'),
 Text(26.627053140096617, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(29.502415458937197, 190.26, 'X[4] <= 0.608\ngini = 0.006\nsamples = 316\nvalue = [31
5, 1]'),
 Text(28.543961352657004, 172.14, 'gini = 0.0\nsamples = 222\nvalue = [222, 0]'),
 Text(30.46086956521739, 172.14, 'X[4] <= 0.609\ngini = 0.021\nsamples = 94\nvalue = [93,
1]'),
 Text(29.502415458937197, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(31.419323671497583, 154.01999999999998, 'gini = 0.0\nsamples = 93\nvalue = [93,
0]'),
 Text(32.37777777777778, 208.38, 'X[2] <= 0.725\ngini = 0.067\nsamples = 58\nvalue = [56,
2]'),
 Text(31.419323671497583, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(33.33623188405797, 190.26, 'X[4] <= 0.634\ngini = 0.034\nsamples = 57\nvalue = [56,
1]'),
 Text(32.37777777777778, 172.14, 'gini = 0.0\nsamples = 44\nvalue = [44, 0]'),
```

```
 Text(34.29468599033817, 172.14, 'X[4] <= 0.638\ngini = 0.142\nsamples = 13\nvalue = [12,
1]'),
 Text(33.33623188405797, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(35.25314009661836, 154.01999999999998, 'gini = 0.0\nsamples = 12\nvalue = [12, 0]'),
 Text(35.25314009661836, 226.49999999999997, 'X[2] <= 0.343\ngini = 0.278\nsamples = 6\nva
lue = [5, 1]'),
 Text(34.29468599033817, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(36.21159420289855, 208.38, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(39.08695652173913, 280.86, 'X[0] <= 0.806\ngini = 0.245\nsamples = 21\nvalue = [18,
3]'),
 Text(38.12850241545894, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(40.045410628019326, 262.74, 'X[1] <= 0.156\ngini = 0.18\nsamples = 20\nvalue = [18,
2]'),
 Text(38.12850241545894, 244.61999999999998, 'X[3] <= 0.507\ngini = 0.105\nsamples = 18\nv
alue = [17, 1]'),
 Text(37.170048309178746, 226.49999999999997, 'gini = 0.0\nsamples = 11\nvalue = [11,
0]'),
 Text(39.08695652173913, 226.49999999999997, 'X[3] <= 0.542\ngini = 0.245\nsamples = 7\nva
lue = [6, 1]'),
 Text(38.12850241545894, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(40.045410628019326, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(41.96231884057971, 244.61999999999998, 'X[0] <= 0.813\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(41.00386473429952, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(42.920772946859906, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(47.95265700483092, 298.98, 'X[3] <= 0.595\ngini = 0.262\nsamples = 103\nvalue = [87,
16]'),
 Text(43.8792270531401, 280.86, 'X[1] <= 0.129\ngini = 0.473\nsamples = 13\nvalue = [5,
8]'),
 Text(42.920772946859906, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(44.83768115942029, 262.74, 'X[3] <= 0.425\ngini = 0.397\nsamples = 11\nvalue = [3,
8]'),
 Text(43.8792270531401, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(45.796135265700485, 244.61999999999998, 'X[0] <= 0.641\ngini = 0.198\nsamples = 9\nv
alue = [1, 8]'),
 Text(44.83768115942029, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(46.75458937198068, 226.49999999999997, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(52.026086956521740, 280.86, 'X[1] <= 0.161\ngini = 0.162\nsamples = 90\nvalue = [82,
8]'),
 Text(48.671497584541065, 262.74, 'X[3] <= 0.634\ngini = 0.088\nsamples = 65\nvalue = [62,
3]'),
 Text(47.71304347826087, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(49.62995169082126, 244.61999999999998, 'X[3] <= 0.705\ngini = 0.061\nsamples = 64\nv
alue = [62, 2]'),
 Text(48.671497584541065, 226.49999999999997, 'X[2] <= 0.572\ngini = 0.32\nsamples = 10\nv
alue = [8, 2]'),
 Text(47.71304347826087, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(49.62995169082126, 208.38, 'X[2] <= 0.746\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(48.671497584541065, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(50.58840579710145, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(50.58840579710145, 226.49999999999997, 'gini = 0.0\nsamples = 54\nvalue = [54, 0]'),
 Text(55.38067632850242, 262.74, 'X[1] <= 0.178\ngini = 0.32\nsamples = 25\nvalue = [20,
5]'),
 Text(53.46376811594203, 244.61999999999998, 'X[4] <= 0.734\ngini = 0.494\nsamples = 9\nva
lue = [5, 4]'),
 Text(52.50531400966184, 226.49999999999997, 'X[1] <= 0.163\ngini = 0.278\nsamples = 6\nva
lue = [5, 1]'),
 Text(51.546859903381645, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(53.46376811594203, 208.38, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(54.422222222222224, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(57.297584541062804, 244.61999999999998, 'X[0] <= 0.658\ngini = 0.117\nsamples = 16\n
value = [15, 1]'),
 Text(56.339130434782610, 226.49999999999997, 'X[4] <= 0.694\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(55.380676328502420, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
```

```
 Text(57.297584541062804, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(58.256038647343, 226.49999999999997, 'gini = 0.0\nsamples = 14\nvalue = [14, 0]'),
 Text(50.8280193236715, 317.1, 'X[0] <= 0.757\ngini = 0.469\nsamples = 8\nvalue = [3,
5]'),
 Text(49.869565217391305, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(51.78647342995169, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(61.13140096618358, 335.21999999999997, 'X[2] <= 0.458\ngini = 0.404\nsamples = 57\nv
alue = [41, 16]'),
 Text(58.256038647343, 317.1, 'X[4] <= 0.704\ngini = 0.499\nsamples = 19\nvalue = [9, 1
0]'),
 Text(57.297584541062804, 298.98, 'X[3] <= 0.466\ngini = 0.408\nsamples = 14\nvalue = [4,
10]'),
 Text(56.33913043478261, 280.86, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(58.256038647343, 280.86, 'X[2] <= 0.282\ngini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(57.297584541062804, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(59.21449275362319, 262.74, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(59.21449275362319, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(64.00676328502415, 317.1, 'X[1] <= 0.197\ngini = 0.266\nsamples = 38\nvalue = [32,
6]'),
 Text(63.04830917874396, 298.98, 'X[2] <= 0.88\ngini = 0.234\nsamples = 37\nvalue = [32,
5]'),
 Text(62.08985507246377, 280.86, 'X[0] <= 0.84\ngini = 0.198\nsamples = 36\nvalue = [32,
4]'),
 Text(61.13140096618358, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(63.04830917874396, 262.74, 'X[1] <= 0.149\ngini = 0.157\nsamples = 35\nvalue = [32,
3]'),
 Text(61.13140096618358, 244.61999999999998, 'X[1] <= 0.009\ngini = 0.067\nsamples = 29\nv
alue = [28, 1]'),
 Text(60.172946859903384, 226.49999999999997, 'X[2] <= 0.511\ngini = 0.444\nsamples = 3\nv
alue = [2, 1]'),
 Text(59.21449275362319, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(61.13140096618358, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(62.08985507246377, 226.49999999999997, 'gini = 0.0\nsamples = 26\nvalue = [26, 0]'),
 Text(64.96521739130435, 244.61999999999998, 'X[1] <= 0.174\ngini = 0.444\nsamples = 6\nva
lue = [4, 2]'),
 Text(64.00676328502415, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(65.92367149758454, 226.49999999999997, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(64.00676328502415, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(64.96521739130435, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(109.54830917874396, 371.46, 'X[4] <= 0.644\ngini = 0.418\nsamples = 501\nvalue = [35
2, 149]'),
 Text(95.54589371980676, 353.34, 'X[0] <= 0.698\ngini = 0.333\nsamples = 355\nvalue = [28
0, 75]'),
 Text(83.47536231884058, 335.21999999999997, 'X[0] <= 0.508\ngini = 0.252\nsamples = 284\n
value = [242, 42]'),
 Text(73.59130434782608, 317.1, 'X[3] <= 0.321\ngini = 0.468\nsamples = 75\nvalue = [47, 2
8]'),
 Text(68.79903381642512, 298.98, 'X[1] <= 0.237\ngini = 0.476\nsamples = 41\nvalue = [16,
25]'),
 Text(66.88212560386474, 280.86, 'X[4] <= 0.293\ngini = 0.219\nsamples = 16\nvalue = [2, 1
4]'),
 Text(65.92367149758454, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(67.84057971014492, 262.74, 'X[0] <= 0.483\ngini = 0.124\nsamples = 15\nvalue = [1, 1
4]'),
 Text(66.88212560386474, 244.61999999999998, 'gini = 0.0\nsamples = 11\nvalue = [0, 11]'),
 Text(68.79903381642512, 244.61999999999998, 'X[4] <= 0.412\ngini = 0.375\nsamples = 4\nva
lue = [1, 3]'),
 Text(67.84057971014492, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(69.75748792270531, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(70.71594202898551, 280.86, 'X[3] <= 0.175\ngini = 0.493\nsamples = 25\nvalue = [14,
11]'),
 Text(69.75748792270531, 262.74, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(71.6743961352657, 262.74, 'X[2] <= 0.354\ngini = 0.475\nsamples = 18\nvalue = [7, 1
1]'),
 Text(70.71594202898551, 244.61999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
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 Text(72.6328502415459, 244.61999999999998, 'X[1] <= 0.244\ngini = 0.391\nsamples = 15\nva
lue = [4, 11]'),
 Text(71.6743961352657, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(73.59130434782608, 226.49999999999997, 'X[2] <= 0.606\ngini = 0.337\nsamples = 14\nv
alue = [3, 11]'),
 Text(72.6328502415459, 208.38, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(74.54975845410628, 208.38, 'X[0] <= 0.469\ngini = 0.5\nsamples = 6\nvalue = [3,
3]'),
 Text(73.59130434782608, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(75.50821256038647, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(78.38357487922706, 298.98, 'X[2] <= 0.836\ngini = 0.161\nsamples = 34\nvalue = [31,
3]'),
 Text(77.42512077294685, 280.86, 'X[4] <= 0.383\ngini = 0.114\nsamples = 33\nvalue = [31,
2]'),
 Text(75.50821256038647, 262.74, 'X[3] <= 0.348\ngini = 0.5\nsamples = 2\nvalue = [1,
1]'),
 Text(74.54975845410628, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(76.46666666666667, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(79.34202898550724, 262.74, 'X[4] <= 0.588\ngini = 0.062\nsamples = 31\nvalue = [30,
1]'),
 Text(78.38357487922706, 244.61999999999998, 'gini = 0.0\nsamples = 28\nvalue = [28, 0]'),
 Text(80.30048309178744, 244.61999999999998, 'X[4] <= 0.597\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(79.34202898550724, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(81.25893719806763, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(79.34202898550724, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(93.35942028985507, 317.1, 'X[1] <= 0.287\ngini = 0.125\nsamples = 209\nvalue = [195,
14]'),
 Text(92.40096618357488, 298.98, 'X[4] <= 0.521\ngini = 0.117\nsamples = 208\nvalue = [19
5, 13]'),
 Text(88.68695652173913, 280.86, 'X[4] <= 0.519\ngini = 0.214\nsamples = 82\nvalue = [72,
10]'),
 Text(87.72850241545893, 262.74, 'X[4] <= 0.419\ngini = 0.198\nsamples = 81\nvalue = [72,
9]'),
 Text(84.13429951690821, 244.61999999999998, 'X[1] <= 0.231\ngini = 0.091\nsamples = 42\nv
alue = [40, 2]'),
 Text(83.17584541062801, 226.49999999999997, 'X[1] <= 0.225\ngini = 0.444\nsamples = 6\nva
lue = [4, 2]'),
 Text(82.21739130434783, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(84.13429951690821, 208.38, 'X[4] <= 0.354\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(83.17584541062801, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(85.0927536231884, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(85.0927536231884, 226.49999999999997, 'gini = 0.0\nsamples = 36\nvalue = [36, 0]'),
 Text(91.32270531400967, 244.61999999999998, 'X[3] <= 0.336\ngini = 0.295\nsamples = 39\nv
alue = [32, 7]'),
 Text(90.36425120772947, 226.49999999999997, 'X[4] <= 0.423\ngini = 0.234\nsamples = 37\nv
alue = [32, 5]'),
 Text(87.96811594202899, 208.38, 'X[2] <= 0.393\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(87.00966183574879, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(88.92657004830917, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(92.76038647342995, 208.38, 'X[2] <= 0.628\ngini = 0.161\nsamples = 34\nvalue = [31,
3]'),
 Text(90.84347826086956, 190.26, 'X[4] <= 0.443\ngini = 0.074\nsamples = 26\nvalue = [25,
1]'),
 Text(89.88502415458937, 172.14, 'X[4] <= 0.439\ngini = 0.278\nsamples = 6\nvalue = [5,
1]'),
 Text(88.92657004830917, 154.01999999999998, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(90.84347826086956, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(91.80193236714976, 172.14, 'gini = 0.0\nsamples = 20\nvalue = [20, 0]'),
 Text(94.67729468599033, 190.26, 'X[3] <= 0.293\ngini = 0.375\nsamples = 8\nvalue = [6,
2]'),
 Text(93.71884057971015, 172.14, 'X[2] <= 0.648\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(92.76038647342995, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
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 Text(94.67729468599033, 154.01999999999998, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(95.63574879227053, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(92.28115942028985, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(89.64541062801932, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(96.11497584541063, 280.86, 'X[0] <= 0.668\ngini = 0.046\nsamples = 126\nvalue = [123, 3]'),
 Text(94.19806763285024, 262.74, 'X[3] <= 0.615\ngini = 0.017\nsamples = 114\nvalue = [113, 1]'),
 Text(93.23961352657005, 244.61999999999998, 'gini = 0.0\nsamples = 96\nvalue = [96, 0]'),
 Text(95.15652173913044, 244.61999999999998, 'X[3] <= 0.628\ngini = 0.105\nsamples = 18\nvalue = [17, 1]'),
 Text(94.19806763285024, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(96.11497584541063, 226.49999999999997, 'gini = 0.0\nsamples = 17\nvalue = [17, 0]'),
 Text(98.03188405797101, 262.74, 'X[1] <= 0.265\ngini = 0.278\nsamples = 12\nvalue = [10, 2]'),
 Text(97.07342995169083, 244.61999999999998, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(98.99033816425121, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(94.31787439613527, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(107.61642512077294, 335.21999999999997, 'X[4] <= 0.517\ngini = 0.498\nsamples = 71\nvalue = [38, 33]'),
 Text(105.69951690821256, 317.1, 'X[0] <= 0.969\ngini = 0.184\nsamples = 39\nvalue = [35, 4]'),
 Text(104.74106280193237, 298.98, 'X[3] <= 0.637\ngini = 0.145\nsamples = 38\nvalue = [35, 3]'),
 Text(102.82415458937199, 280.86, 'X[1] <= 0.209\ngini = 0.059\nsamples = 33\nvalue = [32, 1]'),
 Text(101.86570048309179, 262.74, 'X[1] <= 0.208\ngini = 0.5\nsamples = 2\nvalue = [1, 1]'),
 Text(100.9072463768116, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(102.82415458937199, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(103.78260869565217, 262.74, 'gini = 0.0\nsamples = 31\nvalue = [31, 0]'),
 Text(106.65797101449276, 280.86, 'X[2] <= 0.662\ngini = 0.48\nsamples = 5\nvalue = [3, 2]'),
 Text(105.69951690821256, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(107.61642512077294, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(106.65797101449276, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(109.53333333333333, 317.1, 'X[3] <= 0.295\ngini = 0.17\nsamples = 32\nvalue = [3, 29]'),
 Text(108.57487922705315, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(110.49178743961353, 298.98, 'gini = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(123.55072463768116, 353.34, 'X[3] <= 0.603\ngini = 0.5\nsamples = 146\nvalue = [72, 74]'),
 Text(116.48212560386473, 335.21999999999997, 'X[0] <= 0.687\ngini = 0.412\nsamples = 62\nvalue = [18, 44]'),
 Text(113.3671497584541, 317.1, 'X[4] <= 0.67\ngini = 0.114\nsamples = 33\nvalue = [2, 31]'),
 Text(112.40869565217392, 298.98, 'X[3] <= 0.539\ngini = 0.48\nsamples = 5\nvalue = [2, 3]'),
 Text(111.45024154589372, 280.86, 'X[0] <= 0.676\ngini = 0.444\nsamples = 3\nvalue = [2, 1]'),
 Text(110.49178743961353, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(112.40869565217392, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(113.3671497584541, 280.86, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(114.3256038647343, 298.98, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(119.59710144927536, 317.1, 'X[2] <= 0.398\ngini = 0.495\nsamples = 29\nvalue = [16, 13]'),
 Text(116.24251207729469, 298.98, 'X[2] <= 0.163\ngini = 0.32\nsamples = 10\nvalue = [2, 8]'),
 Text(115.28405797101449, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(117.20096618357488, 280.86, 'X[4] <= 0.744\ngini = 0.198\nsamples = 9\nvalue = [1, 8]'),
 Text(116.24251207729469, 262.74, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(118.15942028985508, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(122.95169082125604, 298.98, 'X[4] <= 0.682\ngini = 0.388\nsamples = 19\nvalue = [14, 5]'),
 Text(121.03478260869565, 280.86, 'X[0] <= 0.761\ngini = 0.5\nsamples = 8\nvalue = [4,
```

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4]'),
 Text(120.07632850241546, 262.74, 'X[4] <= 0.655\ngini = 0.32\nsamples = 5\nvalue = [4,
1]'),
 Text(119.11787439613526, 244.61999999999998, 'X[3] <= 0.461\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(118.15942028985508, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(120.07632850241546, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(121.03478260869565, 244.61999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(121.99323671497585, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(124.86859903381642, 280.86, 'X[3] <= 0.457\ngini = 0.165\nsamples = 11\nvalue = [10,
1]'),
 Text(123.91014492753624, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(125.82705314009662, 262.74, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(130.6193236714976, 335.21999999999997, 'X[0] <= 0.825\ngini = 0.459\nsamples = 84\nv
alue = [54, 30]'),
 Text(129.66086956521738, 317.1, 'X[4] <= 0.856\ngini = 0.444\nsamples = 81\nvalue = [54,
27]'),
 Text(127.74396135265701, 298.98, 'X[0] <= 0.586\ngini = 0.429\nsamples = 77\nvalue = [53,
24]'),
 Text(126.78550724637681, 280.86, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(128.7024154589372, 280.86, 'X[4] <= 0.811\ngini = 0.448\nsamples = 71\nvalue = [47,
24]'),
 Text(127.74396135265701, 262.74, 'X[1] <= 0.273\ngini = 0.466\nsamples = 65\nvalue = [41,
24]'),
 Text(123.19130434782609, 244.61999999999998, 'X[2] <= 0.342\ngini = 0.431\nsamples = 54\n
value = [37, 17]'),
 Text(122.23285024154589, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(124.14975845410628, 226.49999999999997, 'X[2] <= 0.489\ngini = 0.47\nsamples = 45\nv
alue = [28, 17]'),
 Text(119.83671497584541, 208.38, 'X[4] <= 0.676\ngini = 0.473\nsamples = 13\nvalue = [5,
8]'),
 Text(118.87826086956521, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(120.7951690821256, 190.26, 'X[4] <= 0.727\ngini = 0.397\nsamples = 11\nvalue = [3,
8]'),
 Text(119.83671497584541, 172.14, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(121.7536231884058, 172.14, 'X[2] <= 0.456\ngini = 0.5\nsamples = 6\nvalue = [3,
3]'),
 Text(120.7951690821256, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(122.71207729468598, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(128.46280193236714, 208.38, 'X[3] <= 0.925\ngini = 0.404\nsamples = 32\nvalue = [23,
9]'),
 Text(127.50434782608696, 190.26, 'X[3] <= 0.792\ngini = 0.358\nsamples = 30\nvalue = [23,
7]'),
 Text(126.54589371980676, 172.14, 'X[3] <= 0.75\ngini = 0.423\nsamples = 23\nvalue = [16,
7]'),
 Text(124.62898550724637, 154.01999999999998, 'X[0] <= 0.702\ngini = 0.291\nsamples = 17\n
value = [14, 3]'),
 Text(123.67053140096618, 135.89999999999998, 'X[4] <= 0.718\ngini = 0.42\nsamples = 10\nv
alue = [7, 3]'),
 Text(122.71207729468598, 117.77999999999997, 'X[0] <= 0.695\ngini = 0.219\nsamples = 8\nv
alue = [7, 1]'),
 Text(121.7536231884058, 99.65999999999997, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(123.67053140096618, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(124.62898550724637, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(125.58743961352657, 135.89999999999998, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(128.46280193236714, 154.01999999999998, 'X[1] <= 0.223\ngini = 0.444\nsamples = 6\nv
alue = [2, 4]'),
 Text(127.50434782608696, 135.89999999999998, 'X[4] <= 0.731\ngini = 0.444\nsamples = 3\nv
alue = [2, 1]'),
 Text(126.54589371980676, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(128.46280193236714, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(129.42125603864733, 135.89999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(128.46280193236714, 172.14, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(129.42125603864733, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(132.29661835748792, 244.61999999999998, 'X[4] <= 0.732\ngini = 0.463\nsamples = 11\n
value = [4, 7]'),
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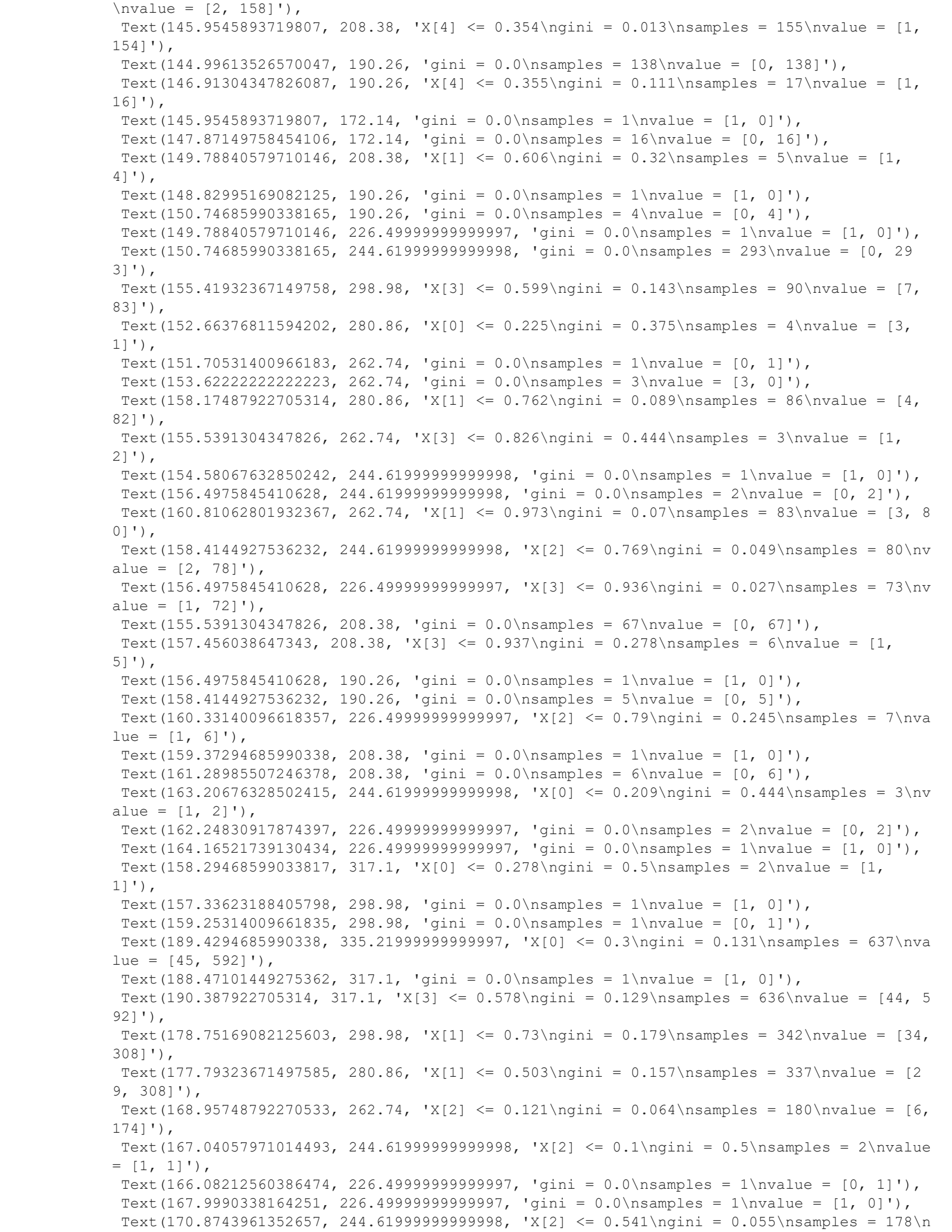
 Text(131.33816425120773, 226.49999999999997, 'X[3] <= 0.619\ngini = 0.219\nsamples = 8\nv
alue = [1, 7]'),
 Text(130.37971014492754, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(132.29661835748792, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(133.2550724637681, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(129.66086956521738, 262.74, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(131.57777777777778, 298.98, 'X[1] <= 0.257\ngini = 0.375\nsamples = 4\nvalue = [1,
3]'),
 Text(130.6193236714976, 280.86, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(132.53623188405797, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(131.57777777777778, 317.1, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(340.553254736564, 407.7, 'X[0] <= 0.405\ngini = 0.397\nsamples = 6068\nvalue = [165
8, 4410]'),
 Text(173.82650966183576, 389.58, 'X[3] <= 0.193\ngini = 0.189\nsamples = 1996\nvalue = [2
11, 1785]'),
 Text(138.76618357487922, 371.46, 'X[1] <= 0.634\ngini = 0.427\nsamples = 55\nvalue = [38,
17]'),
 Text(136.37004830917874, 353.34, 'X[4] <= 0.356\ngini = 0.273\nsamples = 43\nvalue = [36,
7]'),
 Text(134.45314009661837, 335.21999999999997, 'X[0] <= 0.289\ngini = 0.408\nsamples = 7\nv
alue = [2, 5]'),
 Text(133.49468599033816, 317.1, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(135.41159420289856, 317.1, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(138.28695652173914, 335.21999999999997, 'X[4] <= 0.468\ngini = 0.105\nsamples = 36\n
value = [34, 2]'),
 Text(137.32850241545893, 317.1, 'gini = 0.0\nsamples = 26\nvalue = [26, 0]'),
 Text(139.24541062801933, 317.1, 'X[1] <= 0.555\ngini = 0.32\nsamples = 10\nvalue = [8,
2]'),
 Text(138.28695652173914, 298.98, 'X[4] <= 0.484\ngini = 0.198\nsamples = 9\nvalue = [8,
1]'),
 Text(137.32850241545893, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(139.24541062801933, 280.86, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(140.20386473429951, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(141.1623188405797, 353.34, 'X[3] <= 0.186\ngini = 0.278\nsamples = 12\nvalue = [2, 1
0]'),
 Text(140.20386473429951, 335.21999999999997, 'gini = 0.0\nsamples = 10\nvalue = [0, 1
0]'),
 Text(142.12077294685992, 335.21999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(208.88683574879227, 371.46, 'X[4] <= 0.374\ngini = 0.162\nsamples = 1941\nvalue = [1
73, 1768]'),
 Text(171.7205314009662, 353.34, 'X[0] <= 0.3\ngini = 0.093\nsamples = 1209\nvalue = [59,
1150]'),
 Text(154.01159420289855, 335.21999999999997, 'X[3] <= 0.97\ngini = 0.048\nsamples = 572\n
value = [14, 558]'),
 Text(149.72850241545893, 317.1, 'X[1] <= 0.759\ngini = 0.045\nsamples = 570\nvalue = [13,
557]'),
 Text(144.0376811594203, 298.98, 'X[4] <= 0.089\ngini = 0.025\nsamples = 480\nvalue = [6,
474]'),
 Text(141.1623188405797, 280.86, 'X[3] <= 0.559\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(140.20386473429951, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(142.12077294685992, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(146.91304347826087, 280.86, 'X[0] <= 0.124\ngini = 0.021\nsamples = 477\nvalue = [5,
472]'),
 Text(144.0376811594203, 262.74, 'X[0] <= 0.115\ngini = 0.159\nsamples = 23\nvalue = [2, 2
1]'),
 Text(143.0792270531401, 244.61999999999998, 'gini = 0.0\nsamples = 20\nvalue = [0, 20]'),
 Text(144.99613526570047, 244.61999999999998, 'X[3] <= 0.671\ngini = 0.444\nsamples = 3\nv
alue = [2, 1]'),
 Text(144.0376811594203, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(145.9545893719807, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(149.78840579710146, 262.74, 'X[3] <= 0.496\ngini = 0.013\nsamples = 454\nvalue = [3,
451]'),
 Text(148.82995169082125, 244.61999999999998, 'X[3] <= 0.496\ngini = 0.037\nsamples = 161
\nvalue = [3, 158]'),
 Text(147.87149758454106, 226.49999999999997, 'X[1] <= 0.591\ngini = 0.025\nsamples = 160
```


\nvalue = [2, 158]'),
Text(145.9545893719807, 208.38, 'X[4] <= 0.354\ngini = 0.013\nsamples = 155\nvalue = [1, 154]'),
Text(144.99613526570047, 190.26, 'gini = 0.0\nsamples = 138\nvalue = [0, 138]'),
Text(146.91304347826087, 190.26, 'X[4] <= 0.355\ngini = 0.111\nsamples = 17\nvalue = [1, 16]'),
Text(145.9545893719807, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(147.87149758454106, 172.14, 'gini = 0.0\nsamples = 16\nvalue = [0, 16]'),
Text(149.78840579710146, 208.38, 'X[1] <= 0.606\ngini = 0.32\nsamples = 5\nvalue = [1, 4]'),
Text(148.82995169082125, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(150.74685990338165, 190.26, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
Text(149.78840579710146, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(150.74685990338165, 244.61999999999998, 'gini = 0.0\nsamples = 293\nvalue = [0, 293]'),
Text(155.41932367149758, 298.98, 'X[3] <= 0.599\ngini = 0.143\nsamples = 90\nvalue = [7, 83]'),
Text(152.66376811594202, 280.86, 'X[0] <= 0.225\ngini = 0.375\nsamples = 4\nvalue = [3, 1]'),
Text(151.70531400966183, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(153.62222222222223, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(158.17487922705314, 280.86, 'X[1] <= 0.762\ngini = 0.089\nsamples = 86\nvalue = [4, 82]'),
Text(155.5391304347826, 262.74, 'X[3] <= 0.826\ngini = 0.444\nsamples = 3\nvalue = [1, 2]'),
Text(154.58067632850242, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(156.4975845410628, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(160.81062801932367, 262.74, 'X[1] <= 0.973\ngini = 0.07\nsamples = 83\nvalue = [3, 80]'),
Text(158.4144927536232, 244.61999999999998, 'X[2] <= 0.769\ngini = 0.049\nsamples = 80\nvalue = [2, 78]'),
Text(156.4975845410628, 226.49999999999997, 'X[3] <= 0.936\ngini = 0.027\nsamples = 73\nvalue = [1, 72]'),
Text(155.5391304347826, 208.38, 'gini = 0.0\nsamples = 67\nvalue = [0, 67]'),
Text(157.456038647343, 208.38, 'X[3] <= 0.937\ngini = 0.278\nsamples = 6\nvalue = [1, 5]'),
Text(156.4975845410628, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(158.4144927536232, 190.26, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
Text(160.33140096618357, 226.49999999999997, 'X[2] <= 0.79\ngini = 0.245\nsamples = 7\nvalue = [1, 6]'),
Text(159.37294685990338, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(161.28985507246378, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
Text(163.20676328502415, 244.61999999999998, 'X[0] <= 0.209\ngini = 0.444\nsamples = 3\nvalue = [1, 2]'),
Text(162.24830917874397, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(164.16521739130434, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(158.29468599033817, 317.1, 'X[0] <= 0.278\ngini = 0.5\nsamples = 2\nvalue = [1, 1]'),
Text(157.33623188405798, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(159.25314009661835, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(189.4294685990338, 335.21999999999997, 'X[0] <= 0.3\ngini = 0.131\nsamples = 637\nvalue = [45, 592]'),
Text(188.47101449275362, 317.1, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(190.387922705314, 317.1, 'X[3] <= 0.578\ngini = 0.129\nsamples = 636\nvalue = [44, 592]'),
Text(178.75169082125603, 298.98, 'X[1] <= 0.73\ngini = 0.179\nsamples = 342\nvalue = [34, 308]'),
Text(177.79323671497585, 280.86, 'X[1] <= 0.503\ngini = 0.157\nsamples = 337\nvalue = [29, 308]'),
Text(168.95748792270533, 262.74, 'X[2] <= 0.121\ngini = 0.064\nsamples = 180\nvalue = [6, 174]'),
Text(167.04057971014493, 244.61999999999998, 'X[2] <= 0.1\ngini = 0.5\nsamples = 2\nvalue = [1, 1]'),
Text(166.08212560386474, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(167.9990338164251, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(170.8743961352657, 244.61999999999998, 'X[2] <= 0.541\ngini = 0.055\nsamples = 178\n

```
value = [5, 173]'),
 Text(169.9159420289855, 226.49999999999997, 'gini = 0.0\nsamples = 107\nvalue = [0, 10
7]'),
 Text(171.83285024154588, 226.49999999999997, 'X[2] <= 0.547\ngini = 0.131\nsamples = 71\n
value = [5, 66]'),
 Text(170.8743961352657, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(172.7913043478261, 208.38, 'X[3] <= 0.531\ngini = 0.083\nsamples = 69\nvalue = [3, 6
6]'),
 Text(170.3951690821256, 190.26, 'X[1] <= 0.358\ngini = 0.059\nsamples = 66\nvalue = [2, 6
4]'),
 Text(168.47826086956522, 172.14, 'X[1] <= 0.348\ngini = 0.245\nsamples = 7\nvalue = [1,
6]'),
 Text(167.51980676328503, 154.01999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(169.4367149758454, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(172.312077294686, 172.14, 'X[1] <= 0.491\ngini = 0.033\nsamples = 59\nvalue = [1, 5
8]'),
 Text(171.3536231884058, 154.01999999999998, 'gini = 0.0\nsamples = 52\nvalue = [0, 52]'),
 Text(173.27053140096618, 154.01999999999998, 'X[1] <= 0.491\ngini = 0.245\nsamples = 7\nv
alue = [1, 6]'),
 Text(172.312077294686, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(174.22898550724636, 135.89999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(175.18743961352658, 190.26, 'X[0] <= 0.366\ngini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(174.22898550724636, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(176.14589371980676, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(186.62898550724637, 262.74, 'X[3] <= 0.363\ngini = 0.25\nsamples = 157\nvalue = [23,
134]'),
 Text(183.57391304347826, 244.61999999999998, 'X[4] <= 0.187\ngini = 0.32\nsamples = 5\nva
lue = [4, 1]'),
 Text(182.61545893719807, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(184.53236714975844, 226.49999999999997, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(189.68405797101448, 244.61999999999998, 'X[4] <= 0.349\ngini = 0.219\nsamples = 152
\nvalue = [19, 133]'),
 Text(186.44927536231884, 226.49999999999997, 'X[3] <= 0.576\ngini = 0.18\nsamples = 140\n
value = [14, 126]'),
 Text(185.49082125603866, 208.38, 'X[1] <= 0.519\ngini = 0.17\nsamples = 139\nvalue = [13,
126]'),
 Text(179.97971014492754, 190.26, 'X[3] <= 0.482\ngini = 0.351\nsamples = 22\nvalue = [5,
17]'),
 Text(178.06280193236714, 172.14, 'X[4] <= 0.134\ngini = 0.142\nsamples = 13\nvalue = [1,
12]'),
 Text(177.10434782608695, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(179.02125603864735, 154.01999999999998, 'gini = 0.0\nsamples = 12\nvalue = [0, 1
2]'),
 Text(181.8966183574879, 172.14, 'X[0] <= 0.372\ngini = 0.494\nsamples = 9\nvalue = [4,
5]'),
 Text(180.93816425120772, 154.01999999999998, 'X[2] <= 0.483\ngini = 0.408\nsamples = 7\nv
alue = [2, 5]'),
 Text(179.97971014492754, 135.89999999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(181.8966183574879, 135.89999999999998, 'X[4] <= 0.264\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(180.93816425120772, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(182.85507246376812, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(182.85507246376812, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(191.00193236714975, 190.26, 'X[0] <= 0.403\ngini = 0.127\nsamples = 117\nvalue = [8,
109]'),
 Text(188.60579710144927, 172.14, 'X[2] <= 0.445\ngini = 0.114\nsamples = 115\nvalue = [7,
108]'),
 Text(186.6888888888889, 154.01999999999998, 'X[2] <= 0.439\ngini = 0.215\nsamples = 49\nv
alue = [6, 43]'),
 Text(185.73043478260868, 135.89999999999998, 'X[0] <= 0.364\ngini = 0.187\nsamples = 48\n
value = [5, 43]'),
 Text(184.7719806763285, 117.77999999999997, 'X[0] <= 0.36\ngini = 0.278\nsamples = 30\nva
lue = [5, 25]'),
 Text(183.8135265700483, 99.65999999999997, 'X[1] <= 0.592\ngini = 0.238\nsamples = 29\nva
lue = [4, 25]'),
```

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 Text(180.93816425120772, 81.53999999999996, 'X[4] <= 0.304\ngini = 0.091\nsamples = 21\nv
alue = [1, 20]'),
 Text(179.97971014492754, 63.41999999999996, 'gini = 0.0\nsamples = 16\nvalue = [0, 16]'),
 Text(181.8966183574879, 63.41999999999996, 'X[3] <= 0.506\ngini = 0.32\nsamples = 5\nvalu
e = [1, 4]'),
 Text(180.93816425120772, 45.299999999999955, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(182.85507246376812, 45.299999999999955, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(186.6888888888889, 81.53999999999996, 'X[1] <= 0.614\ngini = 0.469\nsamples = 8\nval
ue = [3, 5]'),
 Text(185.73043478260868, 63.41999999999996, 'X[3] <= 0.558\ngini = 0.375\nsamples = 4\nva
lue = [3, 1]'),
 Text(184.7719806763285, 45.299999999999955, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(186.6888888888889, 45.299999999999955, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(187.64734299516908, 63.41999999999996, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(185.73043478260868, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(186.6888888888889, 117.77999999999997, 'gini = 0.0\nsamples = 18\nvalue = [0, 18]'),
 Text(187.64734299516908, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(190.52270531400967, 154.01999999999998, 'X[2] <= 0.821\ngini = 0.03\nsamples = 66\nv
alue = [1, 65]'),
 Text(189.56425120772946, 135.89999999999998, 'gini = 0.0\nsamples = 61\nvalue = [0, 6
1]'),
 Text(191.48115942028986, 135.89999999999998, 'X[2] <= 0.842\ngini = 0.32\nsamples = 5\nva
lue = [1, 4]'),
 Text(190.52270531400967, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(192.43961352657004, 117.77999999999997, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(193.39806763285023, 172.14, 'X[2] <= 0.621\ngini = 0.5\nsamples = 2\nvalue = [1,
1]'),
 Text(192.43961352657004, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(194.35652173913044, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(187.40772946859903, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(192.91884057971015, 226.49999999999997, 'X[3] <= 0.463\ngini = 0.486\nsamples = 12\n
value = [5, 7]'),
 Text(191.96038647342996, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(193.87729468599034, 208.38, 'X[1] <= 0.645\ngini = 0.346\nsamples = 9\nvalue = [2,
7]'),
 Text(192.91884057971015, 190.26, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(194.83574879227052, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(179.71014492753622, 280.86, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(202.024154589372, 298.98, 'X[1] <= 0.89\ngini = 0.066\nsamples = 294\nvalue = [10, 2
84]'),
 Text(199.6280193236715, 280.86, 'X[4] <= 0.355\ngini = 0.049\nsamples = 280\nvalue = [7,
273]'),
 Text(197.7111111111111, 262.74, 'X[4] <= 0.215\ngini = 0.038\nsamples = 259\nvalue = [5,
254]'),
 Text(196.75265700483092, 244.61999999999998, 'gini = 0.0\nsamples = 104\nvalue = [0, 10
4]'),
 Text(198.6695652173913, 244.61999999999998, 'X[4] <= 0.216\ngini = 0.062\nsamples = 155\n
value = [5, 150]'),
 Text(197.7111111111111, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(199.6280193236715, 226.49999999999997, 'X[4] <= 0.222\ngini = 0.051\nsamples = 154\n
value = [4, 150]'),
 Text(197.7111111111111, 208.38, 'X[1] <= 0.635\ngini = 0.32\nsamples = 10\nvalue = [2,
8]'),
 Text(196.75265700483092, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(198.6695652173913, 190.26, 'X[0] <= 0.309\ngini = 0.198\nsamples = 9\nvalue = [1,
8]'),
 Text(197.7111111111111, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(199.6280193236715, 172.14, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(201.54492753623188, 208.38, 'X[1] <= 0.761\ngini = 0.027\nsamples = 144\nvalue = [2,
142]'),
 Text(200.5864734299517, 190.26, 'gini = 0.0\nsamples = 128\nvalue = [0, 128]'),
 Text(202.50338164251207, 190.26, 'X[1] <= 0.764\ngini = 0.219\nsamples = 16\nvalue = [2,
14]'),
 Text(201.54492753623188, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(203.46183574879228, 172.14, 'X[4] <= 0.33\ngini = 0.124\nsamples = 15\nvalue = [1, 1
4]'),
```

```
 Text(202.50338164251207, 154.01999999999998, 'gini = 0.0\nsamples = 13\nvalue = [0, 1
3]'),
 Text(204.42028985507247, 154.01999999999998, 'X[2] <= 0.555\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(203.46183574879228, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(205.37874396135265, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(201.54492753623188, 262.74, 'X[4] <= 0.357\ngini = 0.172\nsamples = 21\nvalue = [2,
19]'),
 Text(200.5864734299517, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(202.50338164251207, 244.61999999999998, 'X[1] <= 0.782\ngini = 0.095\nsamples = 20\n
value = [1, 19]'),
 Text(201.54492753623188, 226.49999999999997, 'gini = 0.0\nsamples = 19\nvalue = [0, 1
9]'),
 Text(203.46183574879228, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(204.42028985507247, 280.86, 'X[3] <= 0.751\ngini = 0.337\nsamples = 14\nvalue = [3,
11]'),
 Text(203.46183574879228, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(205.37874396135265, 262.74, 'gini = 0.0\nsamples = 11\nvalue = [0, 11]'),
 Text(246.05314009661836, 353.34, 'X[1] <= 0.513\ngini = 0.263\nsamples = 732\nvalue = [11
4, 618]'),
 Text(218.0183574879227, 335.21999999999997, 'X[3] <= 0.237\ngini = 0.187\nsamples = 441\n
value = [46, 395]'),
 Text(211.6086956521739, 317.1, 'X[1] <= 0.328\ngini = 0.473\nsamples = 13\nvalue = [8,
5]'),
 Text(210.65024154589372, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(212.5671497584541, 298.98, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(224.4280193236715, 317.1, 'X[0] <= 0.325\ngini = 0.162\nsamples = 428\nvalue = [38,
390]'),
 Text(214.4840579710145, 298.98, 'X[2] <= 0.737\ngini = 0.094\nsamples = 242\nvalue = [12,
230]'),
 Text(210.1710144927536, 280.86, 'X[2] <= 0.433\ngini = 0.054\nsamples = 215\nvalue = [6,
209]'),
 Text(209.21256038647343, 262.74, 'gini = 0.0\nsamples = 91\nvalue = [0, 91]'),
 Text(211.12946859903383, 262.74, 'X[2] <= 0.435\ngini = 0.092\nsamples = 124\nvalue = [6,
118]'),
 Text(210.1710144927536, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(212.087922705314, 244.61999999999998, 'X[2] <= 0.565\ngini = 0.078\nsamples = 123\nv
alue = [5, 118]'),
 Text(211.12946859903383, 226.49999999999997, 'X[2] <= 0.559\ngini = 0.148\nsamples = 62\n
value = [5, 57]'),
 Text(209.21256038647343, 208.38, 'X[3] <= 0.439\ngini = 0.097\nsamples = 59\nvalue = [3,
56]'),
 Text(208.25410628019324, 190.26, 'X[3] <= 0.383\ngini = 0.204\nsamples = 26\nvalue = [3,
23]'),
 Text(207.29565217391306, 172.14, 'gini = 0.0\nsamples = 20\nvalue = [0, 20]'),
 Text(209.21256038647343, 172.14, 'X[4] <= 0.506\ngini = 0.5\nsamples = 6\nvalue = [3,
3]'),
 Text(208.25410628019324, 154.01999999999998, 'X[4] <= 0.44\ngini = 0.375\nsamples = 4\nva
lue = [3, 1]'),
 Text(207.29565217391306, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(209.21256038647343, 135.89999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(210.1710144927536, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(210.1710144927536, 190.26, 'gini = 0.0\nsamples = 33\nvalue = [0, 33]'),
 Text(213.0463768115942, 208.38, 'X[0] <= 0.222\ngini = 0.444\nsamples = 3\nvalue = [2,
1]'),
 Text(212.087922705314, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(214.0048309178744, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(213.0463768115942, 226.49999999999997, 'gini = 0.0\nsamples = 61\nvalue = [0, 61]'),
 Text(218.79710144927537, 280.86, 'X[2] <= 0.785\ngini = 0.346\nsamples = 27\nvalue = [6,
21]'),
 Text(216.88019323671497, 262.74, 'X[2] <= 0.771\ngini = 0.494\nsamples = 9\nvalue = [5,
4]'),
 Text(215.9217391304348, 244.61999999999998, 'X[1] <= 0.43\ngini = 0.444\nsamples = 6\nval
ue = [2, 4]'),
 Text(214.9632850241546, 226.49999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(216.88019323671497, 226.49999999999997, 'X[0] <= 0.313\ngini = 0.444\nsamples = 3\nv
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alue = [2, 1]'),
 Text(215.9217391304348, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(217.83864734299516, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(217.83864734299516, 244.61999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(220.71400966183575, 262.74, 'X[4] <= 0.55\ngini = 0.105\nsamples = 18\nvalue = [1, 1
7]'),
 Text(219.75555555555556, 244.61999999999998, 'gini = 0.0\nsamples = 15\nvalue = [0, 1
5]'),
 Text(221.67246376811593, 244.61999999999998, 'X[1] <= 0.423\ngini = 0.444\nsamples = 3\nv
alue = [1, 2]'),
 Text(220.71400966183575, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(222.63091787439615, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(234.3719806763285, 298.98, 'X[4] <= 0.456\ngini = 0.24\nsamples = 186\nvalue = [26,
 160]'),
 Text(226.943961352657, 280.86, 'X[0] <= 0.327\ngini = 0.124\nsamples = 90\nvalue = [6, 8
4]'),
 Text(225.9855072463768, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(227.90241545893718, 262.74, 'X[0] <= 0.384\ngini = 0.087\nsamples = 88\nvalue = [4,
 84]'),
 Text(225.5062801932367, 244.61999999999998, 'X[4] <= 0.392\ngini = 0.029\nsamples = 67\nv
alue = [1, 66]'),
 Text(224.54782608695652, 226.49999999999997, 'X[4] <= 0.391\ngini = 0.165\nsamples = 11\n
value = [1, 10]'),
 Text(223.58937198067633, 208.38, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(225.5062801932367, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(226.46473429951692, 226.49999999999997, 'gini = 0.0\nsamples = 56\nvalue = [0, 5
6]'),
 Text(230.2985507246377, 244.61999999999998, 'X[0] <= 0.385\ngini = 0.245\nsamples = 21\nv
alue = [3, 18]'),
 Text(228.3816425120773, 226.49999999999997, 'X[2] <= 0.685\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(227.4231884057971, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(229.34009661835748, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(232.21545893719806, 226.49999999999997, 'X[3] <= 0.307\ngini = 0.105\nsamples = 18\n
value = [1, 17]'),
 Text(231.25700483091788, 208.38, 'X[3] <= 0.285\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(230.2985507246377, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(232.21545893719806, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(233.17391304347825, 208.38, 'gini = 0.0\nsamples = 15\nvalue = [0, 15]'),
 Text(241.8, 280.86, 'X[4] <= 0.64\ngini = 0.33\nsamples = 96\nvalue = [20, 76]'),
 Text(240.8415458937198, 262.74, 'X[3] <= 0.61\ngini = 0.391\nsamples = 75\nvalue = [20, 5
5]'),
 Text(239.8830917874396, 244.61999999999998, 'X[3] <= 0.382\ngini = 0.349\nsamples = 71\nv
alue = [16, 55]'),
 Text(236.04927536231884, 226.49999999999997, 'X[1] <= 0.387\ngini = 0.48\nsamples = 25\nv
alue = [10, 15]'),
 Text(235.09082125603865, 208.38, 'X[2] <= 0.261\ngini = 0.278\nsamples = 18\nvalue = [3,
 15]'),
 Text(234.13236714975847, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(236.04927536231884, 190.26, 'X[4] <= 0.456\ngini = 0.208\nsamples = 17\nvalue = [2,
 15]'),
 Text(235.09082125603865, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(237.00772946859902, 172.14, 'X[3] <= 0.369\ngini = 0.117\nsamples = 16\nvalue = [1,
 15]'),
 Text(236.04927536231884, 154.01999999999998, 'gini = 0.0\nsamples = 13\nvalue = [0, 1
3]'),
 Text(237.96618357487924, 154.01999999999998, 'X[3] <= 0.372\ngini = 0.444\nsamples = 3\nv
alue = [1, 2]'),
 Text(237.00772946859902, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(238.92463768115942, 135.89999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(237.00772946859902, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(243.71690821256038, 226.49999999999997, 'X[2] <= 0.605\ngini = 0.227\nsamples = 46\n
value = [6, 40]'),
 Text(240.8415458937198, 208.38, 'X[0] <= 0.389\ngini = 0.108\nsamples = 35\nvalue = [2, 3
3]'),
```

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 Text(239.8830917874396, 190.26, 'gini = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(241.8, 190.26, 'X[0] <= 0.401\ngini = 0.444\nsamples = 6\nvalue = [2, 4]'),
 Text(240.8415458937198, 172.14, 'X[4] <= 0.498\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(239.8830917874396, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(241.8, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(242.7584541062802, 172.14, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(246.59227053140097, 208.38, 'X[4] <= 0.508\ngini = 0.463\nsamples = 11\nvalue = [4,
 7]'),
 Text(245.63381642512078, 190.26, 'X[1] <= 0.323\ngini = 0.219\nsamples = 8\nvalue = [1,
 7]'),
 Text(244.67536231884057, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(246.59227053140097, 172.14, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(247.55072463768116, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(241.8, 244.61999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(242.7584541062802, 262.74, 'gini = 0.0\nsamples = 21\nvalue = [0, 21]'),
 Text(274.087922705314, 335.21999999999997, 'X[4] <= 0.604\ngini = 0.358\nsamples = 291\nv
alue = [68, 223]'),
 Text(264.20386473429954, 317.1, 'X[3] <= 0.513\ngini = 0.454\nsamples = 184\nvalue = [64,
 120]'),
 Text(255.93719806763283, 298.98, 'X[1] <= 0.755\ngini = 0.441\nsamples = 73\nvalue = [49,
 24]'),
 Text(250.90531400966182, 280.86, 'X[0] <= 0.158\ngini = 0.282\nsamples = 53\nvalue = [44,
 9]'),
 Text(249.94685990338164, 262.74, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(251.86376811594204, 262.74, 'X[4] <= 0.395\ngini = 0.237\nsamples = 51\nvalue = [44,
 7]'),
 Text(248.50917874396134, 244.61999999999998, 'X[1] <= 0.573\ngini = 0.49\nsamples = 7\nva
lue = [4, 3]'),
 Text(247.55072463768116, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(249.46763285024156, 226.49999999999997, 'X[4] <= 0.394\ngini = 0.32\nsamples = 5\nva
lue = [4, 1]'),
 Text(248.50917874396134, 208.38, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(250.42608695652174, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(255.2183574879227, 244.61999999999998, 'X[4] <= 0.579\ngini = 0.165\nsamples = 44\nv
alue = [40, 4]'),
 Text(253.30144927536233, 226.49999999999997, 'X[1] <= 0.515\ngini = 0.095\nsamples = 40\n
value = [38, 2]'),
 Text(252.34299516908212, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(254.25990338164252, 208.38, 'X[1] <= 0.539\ngini = 0.05\nsamples = 39\nvalue = [38,
 1]'),
 Text(253.30144927536233, 190.26, 'X[1] <= 0.532\ngini = 0.375\nsamples = 4\nvalue = [3,
 1]'),
 Text(252.34299516908212, 172.14, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(254.25990338164252, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(255.2183574879227, 190.26, 'gini = 0.0\nsamples = 35\nvalue = [35, 0]'),
 Text(257.1352657004831, 226.49999999999997, 'X[2] <= 0.424\ngini = 0.5\nsamples = 4\nvalu
e = [2, 2]'),
 Text(256.1768115942029, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(258.09371980676326, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(260.96908212560385, 280.86, 'X[3] <= 0.437\ngini = 0.375\nsamples = 20\nvalue = [5,
 15]'),
 Text(259.0521739130435, 262.74, 'X[1] <= 0.942\ngini = 0.133\nsamples = 14\nvalue = [1, 1
3]'),
 Text(258.09371980676326, 244.61999999999998, 'gini = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
 Text(260.0106280193237, 244.61999999999998, 'X[4] <= 0.504\ngini = 0.444\nsamples = 3\nva
lue = [1, 2]'),
 Text(259.0521739130435, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(260.96908212560385, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(262.8859903381643, 262.74, 'X[0] <= 0.398\ngini = 0.444\nsamples = 6\nvalue = [4,
 2]'),
 Text(261.92753623188406, 244.61999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(263.84444444444443, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(272.4705314009662, 298.98, 'X[1] <= 0.671\ngini = 0.234\nsamples = 111\nvalue = [15,
 96]'),
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 Text(268.6367149758454, 280.86, 'X[4] <= 0.567\ngini = 0.112\nsamples = 84\nvalue = [5, 7
9]'),
 Text(266.719806763285, 262.74, 'X[2] <= 0.163\ngini = 0.071\nsamples = 81\nvalue = [3, 7
8]'),
 Text(265.7613526570048, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(267.67826086956524, 244.61999999999998, 'X[2] <= 0.845\ngini = 0.049\nsamples = 80\n
value = [2, 78]'),
 Text(265.7613526570048, 226.49999999999997, 'X[1] <= 0.54\ngini = 0.026\nsamples = 76\nva
lue = [1, 75]'),
 Text(264.80289855072465, 208.38, 'X[1] <= 0.536\ngini = 0.142\nsamples = 13\nvalue = [1,
 12]'),
 Text(263.84444444444443, 190.26, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(265.7613526570048, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(266.719806763285, 208.38, 'gini = 0.0\nsamples = 63\nvalue = [0, 63]'),
 Text(269.5951690821256, 226.49999999999997, 'X[2] <= 0.873\ngini = 0.375\nsamples = 4\nva
lue = [1, 3]'),
 Text(268.6367149758454, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(270.5536231884058, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(270.5536231884058, 262.74, 'X[2] <= 0.462\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(269.5951690821256, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(271.512077294686, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(276.30434782608694, 280.86, 'X[3] <= 0.667\ngini = 0.466\nsamples = 27\nvalue = [10,
 17]'),
 Text(274.38743961352657, 262.74, 'X[4] <= 0.501\ngini = 0.492\nsamples = 16\nvalue = [9,
 7]'),
 Text(273.42898550724635, 244.61999999999998, 'X[2] <= 0.84\ngini = 0.18\nsamples = 10\nva
lue = [9, 1]'),
 Text(272.4705314009662, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(274.38743961352657, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(275.3458937198068, 244.61999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(278.22125603864737, 262.74, 'X[2] <= 0.176\ngini = 0.165\nsamples = 11\nvalue = [1,
 10]'),
 Text(277.26280193236715, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(279.1797101449275, 244.61999999999998, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(283.9719806763285, 317.1, 'X[2] <= 0.113\ngini = 0.072\nsamples = 107\nvalue = [4, 1
03]'),
 Text(283.0135265700483, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(284.9304347826087, 298.98, 'X[0] <= 0.253\ngini = 0.055\nsamples = 106\nvalue = [3,
 103]'),
 Text(283.0135265700483, 280.86, 'X[4] <= 0.711\ngini = 0.444\nsamples = 6\nvalue = [2,
 4]'),
 Text(282.0550724637681, 262.74, 'X[3] <= 0.493\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(281.0966183574879, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(283.0135265700483, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(283.9719806763285, 262.74, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(286.8473429951691, 280.86, 'X[4] <= 0.618\ngini = 0.02\nsamples = 100\nvalue = [1, 9
9]'),
 Text(285.8888888888889, 262.74, 'X[4] <= 0.614\ngini = 0.18\nsamples = 10\nvalue = [1,
 9]'),
 Text(284.9304347826087, 244.61999999999998, 'gini = 0.0\nsamples = 9\nvalue = [0, 9]'),
 Text(286.8473429951691, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(287.8057971014493, 262.74, 'gini = 0.0\nsamples = 90\nvalue = [0, 90]'),
 Text(507.27999981129227, 389.58, 'X[4] <= 0.426\ngini = 0.458\nsamples = 4072\nvalue = [1
447, 2625]'),
 Text(373.38339371980675, 371.46, 'X[0] <= 0.485\ngini = 0.475\nsamples = 1473\nvalue = [9
00, 573]'),
 Text(320.7339371980676, 353.34, 'X[3] <= 0.197\ngini = 0.403\nsamples = 447\nvalue = [12
5, 322]'),
 Text(312.23140096618357, 335.21999999999997, 'X[0] <= 0.446\ngini = 0.245\nsamples = 7\nv
alue = [6, 1]'),
 Text(311.27294685990336, 317.1, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(313.1898550724638, 317.1, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(329.2364734299517, 335.21999999999997, 'X[1] <= 0.866\ngini = 0.395\nsamples = 440\n
value = [119, 321]'),
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 Text(315.10676328502416, 317.1, 'X[4] <= 0.235\ngini = 0.387\nsamples = 434\nvalue = [11
4, 320]'),
 Text(289.72270531400966, 298.98, 'X[1] <= 0.412\ngini = 0.233\nsamples = 89\nvalue = [12,
 77]'),
 Text(288.76425120772944, 280.86, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(290.6811594202899, 280.86, 'X[2] <= 0.954\ngini = 0.187\nsamples = 86\nvalue = [9, 7
7]'),
 Text(289.72270531400966, 262.74, 'X[3] <= 0.514\ngini = 0.171\nsamples = 85\nvalue = [8,
 77]'),
 Text(288.76425120772944, 244.61999999999998, 'gini = 0.0\nsamples = 21\nvalue = [0, 2
1]'),
 Text(290.6811594202899, 244.61999999999998, 'X[1] <= 0.543\ngini = 0.219\nsamples = 64\nv
alue = [8, 56]'),
 Text(289.72270531400966, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(291.63961352657003, 226.49999999999997, 'X[0] <= 0.483\ngini = 0.175\nsamples = 62\n
value = [6, 56]'),
 Text(290.6811594202899, 208.38, 'X[4] <= 0.18\ngini = 0.15\nsamples = 61\nvalue = [5, 5
6]'),
 Text(288.76425120772944, 190.26, 'X[4] <= 0.178\ngini = 0.269\nsamples = 25\nvalue = [4,
 21]'),
 Text(287.8057971014493, 172.14, 'X[0] <= 0.475\ngini = 0.219\nsamples = 24\nvalue = [3, 2
1]'),
 Text(286.8473429951691, 154.01999999999998, 'X[2] <= 0.644\ngini = 0.159\nsamples = 23\nv
alue = [2, 21]'),
 Text(285.8888888888889, 135.89999999999998, 'gini = 0.0\nsamples = 19\nvalue = [0, 19]'),
 Text(287.8057971014493, 135.89999999999998, 'X[4] <= 0.162\ngini = 0.5\nsamples = 4\nvalu
e = [2, 2]'),
 Text(286.8473429951691, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(288.76425120772944, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(288.76425120772944, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(289.72270531400966, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(292.59806763285025, 190.26, 'X[1] <= 0.614\ngini = 0.054\nsamples = 36\nvalue = [1,
 35]'),
 Text(291.63961352657003, 172.14, 'X[1] <= 0.612\ngini = 0.219\nsamples = 8\nvalue = [1,
 7]'),
 Text(290.6811594202899, 154.01999999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(292.59806763285025, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(293.55652173913046, 172.14, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(292.59806763285025, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(291.63961352657003, 262.74, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(340.49082125603866, 298.98, 'X[1] <= 0.682\ngini = 0.416\nsamples = 345\nvalue = [10
2, 243]'),
 Text(327.52173913043475, 280.86, 'X[3] <= 0.55\ngini = 0.382\nsamples = 303\nvalue = [78,
 225]'),
 Text(315.7207729468599, 262.74, 'X[1] <= 0.531\ngini = 0.421\nsamples = 219\nvalue = [66,
 153]'),
 Text(306.73526570048307, 244.61999999999998, 'X[3] <= 0.54\ngini = 0.347\nsamples = 170\n
value = [38, 132]'),
 Text(305.7768115942029, 226.49999999999997, 'X[0] <= 0.435\ngini = 0.337\nsamples = 168\n
value = [36, 132]'),
 Text(298.82801932367147, 208.38, 'X[4] <= 0.383\ngini = 0.229\nsamples = 76\nvalue = [10,
 66]'),
 Text(297.8695652173913, 190.26, 'X[1] <= 0.33\ngini = 0.293\nsamples = 56\nvalue = [10, 4
6]'),
 Text(295.47342995169083, 172.14, 'X[2] <= 0.21\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(294.5149758454106, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(296.431884057971, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(300.2657004830918, 172.14, 'X[2] <= 0.576\ngini = 0.256\nsamples = 53\nvalue = [8, 4
5]'),
 Text(298.3487922705314, 154.01999999999998, 'X[4] <= 0.38\ngini = 0.105\nsamples = 36\nva
lue = [2, 34]'),
 Text(297.3903381642512, 135.89999999999998, 'X[4] <= 0.254\ngini = 0.056\nsamples = 35\nv
alue = [1, 34]'),
 Text(296.431884057971, 117.77999999999997, 'X[4] <= 0.251\ngini = 0.375\nsamples = 4\nval
ue = [1, 3]'),
```

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 Text(295.47342995169083, 99.65999999999997, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(297.3903381642512, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(298.3487922705314, 117.77999999999997, 'gini = 0.0\nsamples = 31\nvalue = [0, 31]'),
 Text(299.3072463768116, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(302.18260869565216, 154.01999999999998, 'X[4] <= 0.32\ngini = 0.457\nsamples = 17\nv
alue = [6, 11]'),
 Text(301.224154589372, 135.89999999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(303.1410628019324, 135.89999999999998, 'X[3] <= 0.379\ngini = 0.444\nsamples = 9\nva
lue = [6, 3]'),
 Text(302.18260869565216, 117.77999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(304.09951690821254, 117.77999999999997, 'X[3] <= 0.473\ngini = 0.5\nsamples = 6\nval
ue = [3, 3]'),
 Text(303.1410628019324, 99.65999999999997, 'X[1] <= 0.439\ngini = 0.375\nsamples = 4\nval
ue = [1, 3]'),
 Text(302.18260869565216, 81.53999999999996, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(304.09951690821254, 81.53999999999996, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(305.05797101449275, 99.65999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(299.7864734299517, 190.26, 'gini = 0.0\nsamples = 20\nvalue = [0, 20]'),
 Text(312.7256038647343, 208.38, 'X[1] <= 0.425\ngini = 0.405\nsamples = 92\nvalue = [26,
 66]'),
 Text(309.8502415458937, 190.26, 'X[4] <= 0.415\ngini = 0.488\nsamples = 38\nvalue = [16,
 22]'),
 Text(308.89178743961355, 172.14, 'X[1] <= 0.341\ngini = 0.5\nsamples = 32\nvalue = [16, 1
6]'),
 Text(306.9748792270531, 154.01999999999998, 'X[4] <= 0.255\ngini = 0.245\nsamples = 7\nva
lue = [1, 6]'),
 Text(306.01642512077296, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(307.93333333333334, 135.89999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(310.8086956521739, 154.01999999999998, 'X[4] <= 0.402\ngini = 0.48\nsamples = 25\nva
lue = [15, 10]'),
 Text(309.8502415458937, 135.89999999999998, 'X[3] <= 0.431\ngini = 0.499\nsamples = 21\nv
alue = [11, 10]'),
 Text(307.93333333333334, 117.77999999999997, 'X[4] <= 0.292\ngini = 0.48\nsamples = 15\nv
alue = [6, 9]'),
 Text(306.9748792270531, 99.65999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(308.89178743961355, 99.65999999999997, 'X[1] <= 0.414\ngini = 0.375\nsamples = 12\nv
alue = [3, 9]'),
 Text(306.9748792270531, 81.53999999999996, 'X[2] <= 0.676\ngini = 0.198\nsamples = 9\nval
ue = [1, 8]'),
 Text(306.01642512077296, 63.41999999999996, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(307.93333333333334, 63.41999999999996, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(310.8086956521739, 81.53999999999996, 'X[1] <= 0.421\ngini = 0.444\nsamples = 3\nval
ue = [2, 1]'),
 Text(309.8502415458937, 63.41999999999996, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(311.7671497584541, 63.41999999999996, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(311.7671497584541, 117.77999999999997, 'X[1] <= 0.409\ngini = 0.278\nsamples = 6\nva
lue = [5, 1]'),
 Text(310.8086956521739, 99.65999999999997, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(312.7256038647343, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(311.7671497584541, 135.89999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(310.8086956521739, 172.14, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(315.6009661835749, 190.26, 'X[3] <= 0.309\ngini = 0.302\nsamples = 54\nvalue = [10,
 44]'),
 Text(313.6840579710145, 172.14, 'X[1] <= 0.457\ngini = 0.444\nsamples = 6\nvalue = [4,
 2]'),
 Text(312.7256038647343, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(314.64251207729467, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(317.51787439613526, 172.14, 'X[4] <= 0.245\ngini = 0.219\nsamples = 48\nvalue = [6,
 42]'),
 Text(316.5594202898551, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(318.47632850241547, 154.01999999999998, 'X[4] <= 0.365\ngini = 0.19\nsamples = 47\nv
alue = [5, 42]'),
 Text(315.1217391304348, 135.89999999999998, 'X[3] <= 0.474\ngini = 0.059\nsamples = 33\nv
alue = [1, 32]'),
 Text(314.16328502415456, 117.77999999999997, 'gini = 0.0\nsamples = 26\nvalue = [0, 2
6]'),
```

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 Text(316.080193236715, 117.77999999999997, 'X[3] <= 0.487\ngini = 0.245\nsamples = 7\nval
ue = [1, 6]'),
 Text(315.1217391304348, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(317.03864734299515, 99.65999999999997, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(321.8309178743961, 135.89999999999998, 'X[3] <= 0.415\ngini = 0.408\nsamples = 14\nv
alue = [4, 10]'),
 Text(319.91400966183573, 117.77999999999997, 'X[2] <= 0.526\ngini = 0.48\nsamples = 5\nva
lue = [3, 2]'),
 Text(318.9555555555556, 99.65999999999997, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(320.87246376811595, 99.65999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(323.74782608695654, 117.77999999999997, 'X[4] <= 0.368\ngini = 0.198\nsamples = 9\nv
alue = [1, 8]'),
 Text(322.7893719806763, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(324.7062801932367, 99.65999999999997, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(307.6937198067633, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(324.7062801932367, 244.61999999999998, 'X[1] <= 0.609\ngini = 0.49\nsamples = 49\nva
lue = [28, 21]'),
 Text(323.74782608695654, 226.49999999999997, 'X[3] <= 0.467\ngini = 0.499\nsamples = 40\n
value = [19, 21]'),
 Text(321.35169082125606, 208.38, 'X[2] <= 0.67\ngini = 0.337\nsamples = 14\nvalue = [11,
 3]'),
 Text(320.39323671497584, 190.26, 'X[3] <= 0.413\ngini = 0.26\nsamples = 13\nvalue = [11,
 2]'),
 Text(319.4347826086956, 172.14, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(321.35169082125606, 172.14, 'X[1] <= 0.559\ngini = 0.444\nsamples = 6\nvalue = [4,
 2]'),
 Text(320.39323671497584, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(322.3101449275362, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(322.3101449275362, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(326.143961352657, 208.38, 'X[3] <= 0.514\ngini = 0.426\nsamples = 26\nvalue = [8, 1
8]'),
 Text(324.22705314009664, 190.26, 'X[1] <= 0.6\ngini = 0.142\nsamples = 13\nvalue = [1, 1
2]'),
 Text(323.26859903381643, 172.14, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(325.1855072463768, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(328.0608695652174, 190.26, 'X[1] <= 0.55\ngini = 0.497\nsamples = 13\nvalue = [7,
 6]'),
 Text(327.1024154589372, 172.14, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(329.0193236714976, 172.14, 'X[2] <= 0.774\ngini = 0.375\nsamples = 8\nvalue = [2,
 6]'),
 Text(328.0608695652174, 154.01999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(329.97777777777776, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(325.6647342995169, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(339.3227053140097, 262.74, 'X[1] <= 0.579\ngini = 0.245\nsamples = 84\nvalue = [12,
 72]'),
 Text(336.20772946859904, 244.61999999999998, 'X[3] <= 0.596\ngini = 0.389\nsamples = 34\n
value = [9, 25]'),
 Text(332.85314009661835, 226.49999999999997, 'X[0] <= 0.479\ngini = 0.147\nsamples = 25\n
value = [2, 23]'),
 Text(330.936231884058, 208.38, 'X[2] <= 0.657\ngini = 0.083\nsamples = 23\nvalue = [1, 2
2]'),
 Text(329.97777777777776, 190.26, 'gini = 0.0\nsamples = 18\nvalue = [0, 18]'),
 Text(331.8946859903382, 190.26, 'X[2] <= 0.717\ngini = 0.32\nsamples = 5\nvalue = [1,
 4]'),
 Text(330.936231884058, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(332.85314009661835, 172.14, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(334.7700483091787, 208.38, 'X[2] <= 0.559\ngini = 0.5\nsamples = 2\nvalue = [1,
 1]'),
 Text(333.81159420289856, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(335.72850241545893, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(339.56231884057974, 226.49999999999997, 'X[2] <= 0.379\ngini = 0.346\nsamples = 9\nv
alue = [7, 2]'),
 Text(338.6038647342995, 208.38, 'X[1] <= 0.568\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(337.6454106280193, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(339.56231884057974, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
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 Text(340.5207729468599, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(342.43768115942026, 244.61999999999998, 'X[1] <= 0.654\ngini = 0.113\nsamples = 50\n
value = [3, 47]'),
 Text(341.4792270531401, 226.49999999999997, 'gini = 0.0\nsamples = 37\nvalue = [0, 37]'),
 Text(343.3961352657005, 226.49999999999997, 'X[1] <= 0.661\ngini = 0.355\nsamples = 13\nv
alue = [3, 10]'),
 Text(342.43768115942026, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(344.3545893719807, 208.38, 'X[0] <= 0.472\ngini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(343.3961352657005, 190.26, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(345.31304347826085, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(353.4599033816425, 280.86, 'X[3] <= 0.688\ngini = 0.49\nsamples = 42\nvalue = [24, 1
8]'),
 Text(350.1053140096618, 262.74, 'X[3] <= 0.353\ngini = 0.227\nsamples = 23\nvalue = [20,
 3]'),
 Text(349.14685990338165, 244.61999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(351.063768115942, 244.61999999999998, 'X[3] <= 0.625\ngini = 0.165\nsamples = 22\nva
lue = [20, 2]'),
 Text(349.14685990338165, 226.49999999999997, 'X[3] <= 0.457\ngini = 0.1\nsamples = 19\nva
lue = [18, 1]'),
 Text(348.18840579710144, 208.38, 'X[3] <= 0.436\ngini = 0.32\nsamples = 5\nvalue = [4,
 1]'),
 Text(347.2299516908213, 190.26, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(349.14685990338165, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(350.1053140096618, 208.38, 'gini = 0.0\nsamples = 14\nvalue = [14, 0]'),
 Text(352.9806763285024, 226.49999999999997, 'X[4] <= 0.339\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(352.02222222222224, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(353.9391304347826, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(356.8144927536232, 262.74, 'X[0] <= 0.456\ngini = 0.332\nsamples = 19\nvalue = [4, 1
5]'),
 Text(355.856038647343, 244.61999999999998, 'X[2] <= 0.115\ngini = 0.208\nsamples = 17\nva
lue = [2, 15]'),
 Text(354.8975845410628, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(356.8144927536232, 226.49999999999997, 'X[1] <= 0.812\ngini = 0.117\nsamples = 16\nv
alue = [1, 15]'),
 Text(355.856038647343, 208.38, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(357.77294685990336, 208.38, 'X[1] <= 0.816\ngini = 0.375\nsamples = 4\nvalue = [1,
 3]'),
 Text(356.8144927536232, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(358.73140096618357, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(357.77294685990336, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(343.36618357487924, 317.1, 'X[0] <= 0.474\ngini = 0.278\nsamples = 6\nvalue = [5,
 1]'),
 Text(342.40772946859903, 298.98, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(344.3246376811594, 298.98, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(426.0328502415459, 353.34, 'X[3] <= 0.449\ngini = 0.37\nsamples = 1026\nvalue = [77
5, 251]'),
 Text(392.9811594202898, 335.21999999999997, 'X[1] <= 0.617\ngini = 0.488\nsamples = 281\n
value = [162, 119]'),
 Text(376.4328502415459, 317.1, 'X[0] <= 0.525\ngini = 0.451\nsamples = 236\nvalue = [155,
 81]'),
 Text(364.00289855072464, 298.98, 'X[0] <= 0.49\ngini = 0.492\nsamples = 57\nvalue = [25,
 32]'),
 Text(362.08599033816427, 280.86, 'X[4] <= 0.316\ngini = 0.298\nsamples = 11\nvalue = [9,
 2]'),
 Text(361.12753623188405, 262.74, 'X[3] <= 0.402\ngini = 0.5\nsamples = 4\nvalue = [2,
 2]'),
 Text(360.16908212560384, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(362.08599033816427, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(363.0444444444444, 262.74, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(365.919806763285, 280.86, 'X[4] <= 0.421\ngini = 0.454\nsamples = 46\nvalue = [16, 3
0]'),
 Text(364.96135265700485, 262.74, 'X[3] <= 0.24\ngini = 0.408\nsamples = 42\nvalue = [12,
 30]'),
 Text(364.00289855072464, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
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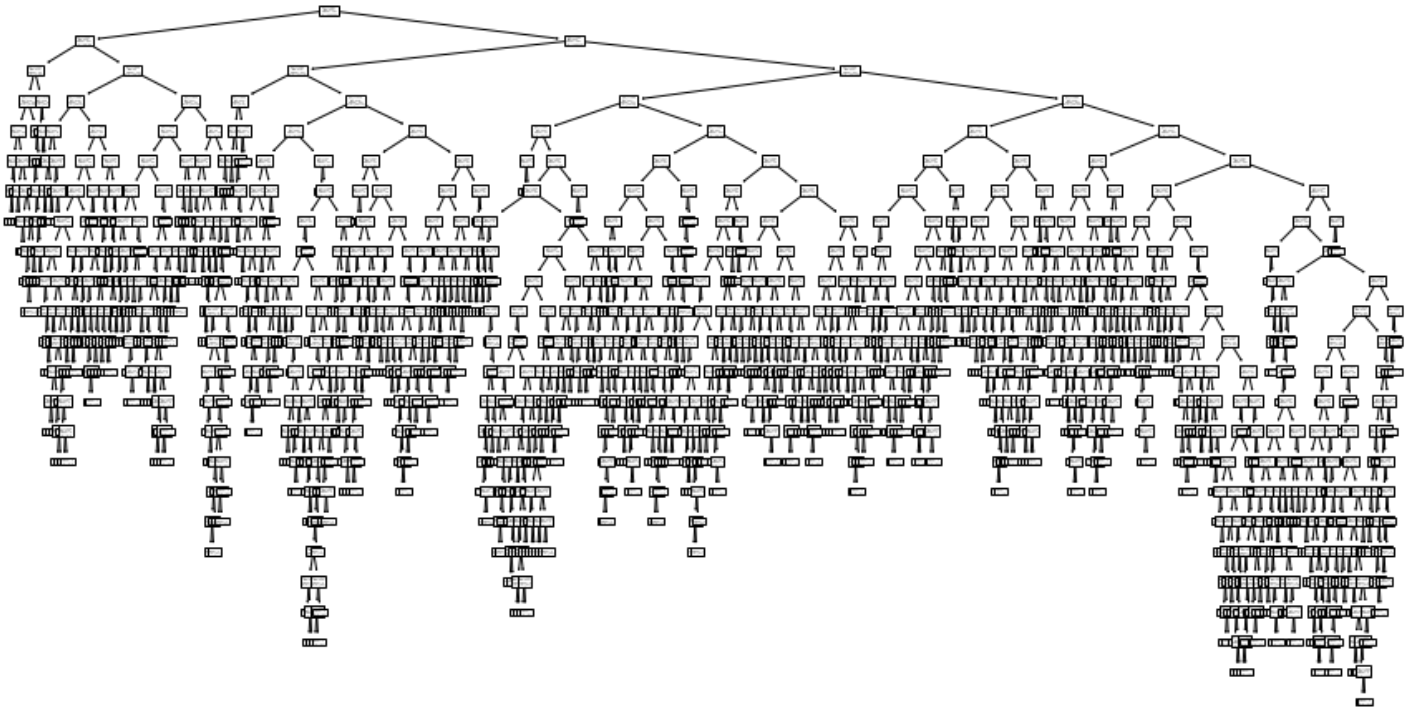
 Text(365.919806763285, 244.61999999999998, 'X[1] <= 0.54\ngini = 0.375\nsamples = 40\nval
ue = [10, 30]'),
 Text(363.52367149758453, 226.49999999999997, 'X[3] <= 0.352\ngini = 0.32\nsamples = 35\nv
alue = [7, 28]'),
 Text(361.60676328502416, 208.38, 'X[2] <= 0.613\ngini = 0.457\nsamples = 17\nvalue = [6,
 11]'),
 Text(360.64830917874394, 190.26, 'X[1] <= 0.451\ngini = 0.337\nsamples = 14\nvalue = [3,
 11]'),
 Text(359.6898550724638, 172.14, 'X[3] <= 0.29\ngini = 0.26\nsamples = 13\nvalue = [2, 1
1]'),
 Text(358.73140096618357, 154.01999999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(360.64830917874394, 154.01999999999998, 'X[3] <= 0.299\ngini = 0.444\nsamples = 6\nv
alue = [2, 4]'),
 Text(359.6898550724638, 135.89999999999998, 'X[4] <= 0.27\ngini = 0.444\nsamples = 3\nval
ue = [2, 1]'),
 Text(358.73140096618357, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(360.64830917874394, 117.77999999999997, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(361.60676328502416, 135.89999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(361.60676328502416, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(362.5652173913044, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(365.4405797101449, 208.38, 'X[0] <= 0.495\ngini = 0.105\nsamples = 18\nvalue = [1, 1
7]'),
 Text(364.48212560386474, 190.26, 'X[1] <= 0.442\ngini = 0.5\nsamples = 2\nvalue = [1,
 1]'),
 Text(363.52367149758453, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(365.4405797101449, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(366.3990338164251, 190.26, 'gini = 0.0\nsamples = 16\nvalue = [0, 16]'),
 Text(368.3159420289855, 226.49999999999997, 'X[0] <= 0.518\ngini = 0.48\nsamples = 5\nval
ue = [3, 2]'),
 Text(367.35748792270533, 208.38, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(369.2743961352657, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(366.8782608695652, 262.74, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(388.8628019323671, 298.98, 'X[1] <= 0.462\ngini = 0.398\nsamples = 179\nvalue = [13
0, 49]'),
 Text(377.54106280193236, 280.86, 'X[0] <= 0.583\ngini = 0.309\nsamples = 115\nvalue = [9
3, 22]'),
 Text(372.1497584541063, 262.74, 'X[2] <= 0.302\ngini = 0.473\nsamples = 39\nvalue = [24,
 15]'),
 Text(371.1913043478261, 244.61999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(373.10821256038645, 244.61999999999998, 'X[4] <= 0.205\ngini = 0.397\nsamples = 33\n
value = [24, 9]'),
 Text(372.1497584541063, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(374.06666666666666, 226.49999999999997, 'X[4] <= 0.339\ngini = 0.375\nsamples = 32\n
value = [24, 8]'),
 Text(371.1913043478261, 208.38, 'X[3] <= 0.207\ngini = 0.208\nsamples = 17\nvalue = [15,
 2]'),
 Text(370.2328502415459, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(372.1497584541063, 190.26, 'X[4] <= 0.242\ngini = 0.117\nsamples = 16\nvalue = [15,
 1]'),
 Text(371.1913043478261, 172.14, 'X[4] <= 0.226\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(370.2328502415459, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(372.1497584541063, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(373.10821256038645, 172.14, 'gini = 0.0\nsamples = 13\nvalue = [13, 0]'),
 Text(376.94202898550725, 208.38, 'X[4] <= 0.41\ngini = 0.48\nsamples = 15\nvalue = [9,
 6]'),
 Text(375.98357487922704, 190.26, 'X[0] <= 0.562\ngini = 0.48\nsamples = 10\nvalue = [4,
 6]'),
 Text(375.0251207729469, 172.14, 'X[3] <= 0.252\ngini = 0.375\nsamples = 8\nvalue = [2,
 6]'),
 Text(374.06666666666666, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(375.98357487922704, 154.01999999999998, 'X[1] <= 0.44\ngini = 0.245\nsamples = 7\nva
lue = [1, 6]'),
 Text(375.0251207729469, 135.89999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(376.94202898550725, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(376.94202898550725, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
```

```
 Text(377.90048309178746, 190.26, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(382.9323671497585, 262.74, 'X[4] <= 0.211\ngini = 0.167\nsamples = 76\nvalue = [69,
 7]'),
 Text(379.81739130434784, 244.61999999999998, 'X[0] <= 0.594\ngini = 0.444\nsamples = 3\nv
alue = [1, 2]'),
 Text(378.8589371980676, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(380.775845410628, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(386.04734299516906, 244.61999999999998, 'X[1] <= 0.32\ngini = 0.128\nsamples = 73\nv
alue = [68, 5]'),
 Text(382.6927536231884, 226.49999999999997, 'X[1] <= 0.315\ngini = 0.375\nsamples = 12\nv
alue = [9, 3]'),
 Text(380.775845410628, 208.38, 'X[3] <= 0.348\ngini = 0.198\nsamples = 9\nvalue = [8,
 1]'),
 Text(379.81739130434784, 190.26, 'X[2] <= 0.423\ngini = 0.5\nsamples = 2\nvalue = [1,
 1]'),
 Text(378.8589371980676, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(380.775845410628, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(381.7342995169082, 190.26, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(384.6096618357488, 208.38, 'X[0] <= 0.602\ngini = 0.444\nsamples = 3\nvalue = [1,
 2]'),
 Text(383.6512077294686, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(385.568115942029, 190.26, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(389.40193236714975, 226.49999999999997, 'X[3] <= 0.316\ngini = 0.063\nsamples = 61\n
value = [59, 2]'),
 Text(388.44347826086954, 208.38, 'X[3] <= 0.313\ngini = 0.245\nsamples = 14\nvalue = [12,
 2]'),
 Text(387.4850241545894, 190.26, 'X[1] <= 0.401\ngini = 0.142\nsamples = 13\nvalue = [12,
 1]'),
 Text(386.52657004830917, 172.14, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(388.44347826086954, 172.14, 'X[3] <= 0.272\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(387.4850241545894, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(389.40193236714975, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(389.40193236714975, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(390.36038647342997, 208.38, 'gini = 0.0\nsamples = 47\nvalue = [47, 0]'),
 Text(400.18454106280194, 280.86, 'X[0] <= 0.796\ngini = 0.488\nsamples = 64\nvalue = [37,
 27]'),
 Text(399.2260869565217, 262.74, 'X[3] <= 0.432\ngini = 0.456\nsamples = 57\nvalue = [37,
 20]'),
 Text(396.5903381642512, 244.61999999999998, 'X[4] <= 0.227\ngini = 0.395\nsamples = 48\nv
alue = [35, 13]'),
 Text(395.63188405797104, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(397.5487922705314, 226.49999999999997, 'X[3] <= 0.373\ngini = 0.364\nsamples = 46\nv
alue = [35, 11]'),
 Text(395.1526570048309, 208.38, 'X[1] <= 0.575\ngini = 0.483\nsamples = 22\nvalue = [13,
 9]'),
 Text(394.1942028985507, 190.26, 'X[3] <= 0.359\ngini = 0.432\nsamples = 19\nvalue = [13,
 6]'),
 Text(392.27729468599034, 172.14, 'X[2] <= 0.74\ngini = 0.26\nsamples = 13\nvalue = [11,
 2]'),
 Text(391.3188405797101, 154.01999999999998, 'X[1] <= 0.485\ngini = 0.153\nsamples = 12\nv
alue = [11, 1]'),
 Text(390.36038647342997, 135.89999999999998, 'X[1] <= 0.473\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(389.40193236714975, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(391.3188405797101, 117.77999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(392.27729468599034, 135.89999999999998, 'gini = 0.0\nsamples = 10\nvalue = [10,
 0]'),
 Text(393.23574879227056, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(396.1111111111111, 172.14, 'X[1] <= 0.552\ngini = 0.444\nsamples = 6\nvalue = [2,
 4]'),
 Text(395.1526570048309, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(397.0695652173913, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(396.1111111111111, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(399.9449275362319, 208.38, 'X[1] <= 0.468\ngini = 0.153\nsamples = 24\nvalue = [22,
 2]'),
```

```
 Text(398.9864734299517, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(400.9033816425121, 190.26, 'X[4] <= 0.27\ngini = 0.083\nsamples = 23\nvalue = [22,
 1]'),
 Text(399.9449275362319, 172.14, 'X[2] <= 0.681\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(398.9864734299517, 154.01999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(400.9033816425121, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(401.86183574879226, 172.14, 'gini = 0.0\nsamples = 20\nvalue = [20, 0]'),
 Text(401.86183574879226, 244.61999999999998, 'X[0] <= 0.551\ngini = 0.346\nsamples = 9\nv
alue = [2, 7]'),
 Text(400.9033816425121, 226.49999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(402.8202898550725, 226.49999999999997, 'X[0] <= 0.74\ngini = 0.219\nsamples = 8\nval
ue = [1, 7]'),
 Text(401.86183574879226, 208.38, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(403.77874396135263, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(401.1429951690821, 262.74, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(409.5294685990338, 317.1, 'X[3] <= 0.423\ngini = 0.263\nsamples = 45\nvalue = [7, 3
8]'),
 Text(408.57101449275365, 298.98, 'X[2] <= 0.783\ngini = 0.172\nsamples = 42\nvalue = [4,
 38]'),
 Text(407.61256038647343, 280.86, 'X[1] <= 0.657\ngini = 0.136\nsamples = 41\nvalue = [3,
 38]'),
 Text(406.6541062801932, 262.74, 'X[1] <= 0.65\ngini = 0.355\nsamples = 13\nvalue = [3, 1
0]'),
 Text(405.69565217391306, 244.61999999999998, 'X[3] <= 0.401\ngini = 0.165\nsamples = 11\n
value = [1, 10]'),
 Text(404.73719806763285, 226.49999999999997, 'gini = 0.0\nsamples = 9\nvalue = [0, 9]'),
 Text(406.6541062801932, 226.49999999999997, 'X[0] <= 0.721\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(405.69565217391306, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(407.61256038647343, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(407.61256038647343, 244.61999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(408.57101449275365, 262.74, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(409.5294685990338, 280.86, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(410.487922705314, 298.98, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(459.0845410628019, 335.21999999999997, 'X[0] <= 0.544\ngini = 0.292\nsamples = 745\n
value = [613, 132]'),
 Text(436.00676328502414, 317.1, 'X[3] <= 0.718\ngini = 0.468\nsamples = 155\nvalue = [97,
 58]'),
 Text(430.8550724637681, 298.98, 'X[4] <= 0.413\ngini = 0.45\nsamples = 143\nvalue = [94,
 49]'),
 Text(425.343961352657, 280.86, 'X[1] <= 0.646\ngini = 0.432\nsamples = 136\nvalue = [93,
 43]'),
 Text(417.19710144927535, 262.74, 'X[1] <= 0.429\ngini = 0.474\nsamples = 96\nvalue = [59,
 37]'),
 Text(416.2386473429952, 244.61999999999998, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(418.15555555555557, 244.61999999999998, 'X[4] <= 0.337\ngini = 0.486\nsamples = 89\n
value = [52, 37]'),
 Text(410.487922705314, 226.49999999999997, 'X[3] <= 0.484\ngini = 0.5\nsamples = 55\nvalu
e = [27, 28]'),
 Text(409.5294685990338, 208.38, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(411.4463768115942, 208.38, 'X[4] <= 0.274\ngini = 0.495\nsamples = 49\nvalue = [27,
 22]'),
 Text(408.09178743961354, 190.26, 'X[1] <= 0.567\ngini = 0.393\nsamples = 26\nvalue = [19,
 7]'),
 Text(407.1333333333333, 172.14, 'gini = 0.0\nsamples = 13\nvalue = [13, 0]'),
 Text(409.0502415458937, 172.14, 'X[2] <= 0.295\ngini = 0.497\nsamples = 13\nvalue = [6,
 7]'),
 Text(408.09178743961354, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(410.0086956521739, 154.01999999999998, 'X[3] <= 0.668\ngini = 0.42\nsamples = 10\nva
lue = [3, 7]'),
 Text(409.0502415458937, 135.89999999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(410.9671497584541, 135.89999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(414.8009661835749, 190.26, 'X[3] <= 0.541\ngini = 0.454\nsamples = 23\nvalue = [8, 1
5]'),
 Text(412.8840579710145, 172.14, 'X[1] <= 0.501\ngini = 0.5\nsamples = 14\nvalue = [7,
```

```
 7]'),
 Text(411.9256038647343, 154.01999999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(413.84251207729466, 154.01999999999998, 'X[4] <= 0.28\ngini = 0.42\nsamples = 10\nva
lue = [7, 3]'),
 Text(412.8840579710145, 135.89999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(414.8009661835749, 135.89999999999998, 'X[3] <= 0.505\ngini = 0.219\nsamples = 8\nva
lue = [7, 1]'),
 Text(413.84251207729466, 117.77999999999997, 'X[4] <= 0.299\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(412.8840579710145, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(414.8009661835749, 99.65999999999997, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(415.7594202898551, 117.77999999999997, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(416.71787439613524, 172.14, 'X[2] <= 0.767\ngini = 0.198\nsamples = 9\nvalue = [1,
 8]'),
 Text(415.7594202898551, 154.01999999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(417.67632850241546, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(425.8231884057971, 226.49999999999997, 'X[0] <= 0.534\ngini = 0.389\nsamples = 34\nv
alue = [25, 9]'),
 Text(423.42705314009663, 208.38, 'X[1] <= 0.457\ngini = 0.293\nsamples = 28\nvalue = [23,
 5]'),
 Text(421.5101449275362, 190.26, 'X[4] <= 0.371\ngini = 0.5\nsamples = 6\nvalue = [3,
 3]'),
 Text(420.55169082125605, 172.14, 'X[2] <= 0.612\ngini = 0.375\nsamples = 4\nvalue = [1,
 3]'),
 Text(419.59323671497583, 154.01999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(421.5101449275362, 154.01999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(422.4685990338164, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(425.343961352657, 190.26, 'X[2] <= 0.164\ngini = 0.165\nsamples = 22\nvalue = [20,
 2]'),
 Text(424.3855072463768, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(426.3024154589372, 172.14, 'X[2] <= 0.77\ngini = 0.091\nsamples = 21\nvalue = [20,
 1]'),
 Text(425.343961352657, 154.01999999999998, 'gini = 0.0\nsamples = 19\nvalue = [19, 0]'),
 Text(427.2608695652174, 154.01999999999998, 'X[4] <= 0.372\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(426.3024154589372, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(428.2193236714976, 135.89999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(428.2193236714976, 208.38, 'X[1] <= 0.521\ngini = 0.444\nsamples = 6\nvalue = [2,
 4]'),
 Text(427.2608695652174, 190.26, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(429.17777777777775, 190.26, 'X[2] <= 0.506\ngini = 0.444\nsamples = 3\nvalue = [2,
 1]'),
 Text(428.2193236714976, 172.14, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(430.13623188405796, 172.14, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(433.49082125603866, 262.74, 'X[4] <= 0.208\ngini = 0.255\nsamples = 40\nvalue = [34,
 6]'),
 Text(430.13623188405796, 244.61999999999998, 'X[3] <= 0.648\ngini = 0.48\nsamples = 5\nva
lue = [2, 3]'),
 Text(429.17777777777775, 226.49999999999997, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(431.0946859903382, 226.49999999999997, 'X[2] <= 0.469\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(430.13623188405796, 208.38, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(432.05314009661834, 208.38, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(436.8454106280193, 244.61999999999998, 'X[3] <= 0.692\ngini = 0.157\nsamples = 35\nv
alue = [32, 3]'),
 Text(434.9285024154589, 226.49999999999997, 'X[2] <= 0.232\ngini = 0.062\nsamples = 31\nv
alue = [30, 1]'),
 Text(433.97004830917876, 208.38, 'X[1] <= 0.678\ngini = 0.5\nsamples = 2\nvalue = [1,
 1]'),
 Text(433.01159420289855, 190.26, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 ...]
```



In [142…
```
dotfile = open("data/tree_gini.dot", 'w')
tree.export_graphviz(clf2, out_file = dotfile, feature_names = xtrain.columns)
dotfile.close()
```

In [33]:
```
ypred2 = clf2.predict(xtest)
```

In [34]:
```
scores2 = cross_val_score(clf2, xtrain, ytrain, cv=5)
scores2
```

Out[34]:
```
array([0.80577957, 0.81115591, 0.80443548, 0.80564896, 0.79018157])
```

In [35]:
```
print("%0.4f accuracy with a standard deviation of %0.4f" % (scores2.mean(), scores2.std()
```

```
0.8034 accuracy with a standard deviation of 0.0070
```

In [36]:
```
hyperparameters = hyperparameters.append({'hyperparameters':'gini', 'accuracy': scores2.me
```

max_depth + gini

Kombinácia hyperparametrov, kedy sa genrovanie rozhodovacieho stromu ukončí po dosiahnutí hodnoty v max_depth a zároveň je v algoritme prítomná "impurity", ktorá náhodne označuje náhodné elementy stromu a toto označenie je nespávne.

In [37]:
```
clf3 = tree.DecisionTreeClassifier(criterion='gini', max_depth=8)
clf3 = clf3.fit(xtrain, ytrain)
plt.figure(figsize=(15,8))
tree.plot_tree(clf3)
```

Out[37]:
```
[Text(306.31507120253167, 410.71999999999997, 'X[1] <= 0.287\ngini = 0.458\nsamples = 7438
\nvalue = [2636, 4802]'),
 Text(117.20648734177216, 362.4, 'X[0] <= 0.439\ngini = 0.409\nsamples = 1370\nvalue = [97
8, 392]'),
 Text(52.75395569620253, 314.08, 'X[3] <= 0.391\ngini = 0.168\nsamples = 194\nvalue = [18,
176]'),
```

```
 Text(38.40664556962025, 265.76, 'X[0] <= 0.417\ngini = 0.122\nsamples = 184\nvalue = [12,
172]'),
 Text(20.306962025316455, 217.44, 'X[4] <= 0.309\ngini = 0.071\nsamples = 162\nvalue = [6,
156]'),
 Text(10.59493670886076, 169.12, 'X[1] <= 0.242\ngini = 0.48\nsamples = 5\nvalue = [2,
3]'),
 Text(7.063291139240507, 120.80000000000001, 'X[4] <= 0.219\ngini = 0.444\nsamples = 3\nva
lue = [2, 1]'),
 Text(3.5316455696202533, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(10.59493670886076, 72.48000000000002, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(14.126582278481013, 120.80000000000001, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(30.018987341772153, 169.12, 'X[2] <= 0.035\ngini = 0.05\nsamples = 157\nvalue = [4,
153]'),
 Text(21.18987341772152, 120.80000000000001, 'X[2] <= 0.013\ngini = 0.5\nsamples = 2\nvalu
e = [1, 1]'),
 Text(17.658227848101266, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(24.721518987341774, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(38.848101265822784, 120.80000000000001, 'X[4] <= 0.363\ngini = 0.038\nsamples = 155
\nvalue = [3, 152]'),
 Text(31.78481012658228, 72.48000000000002, 'X[4] <= 0.36\ngini = 0.219\nsamples = 8\nvalu
e = [1, 7]'),
 Text(28.253164556962027, 24.159999999999968, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(35.31645569620253, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(45.911392405063296, 72.48000000000002, 'X[4] <= 0.627\ngini = 0.027\nsamples = 147\n
value = [2, 145]'),
 Text(42.37974683544304, 24.159999999999968, 'gini = 0.015\nsamples = 136\nvalue = [1, 13
5]'),
 Text(49.44303797468355, 24.159999999999968, 'gini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(56.50632911392405, 217.44, 'X[4] <= 0.475\ngini = 0.397\nsamples = 22\nvalue = [6, 1
6]'),
 Text(52.9746835443038, 169.12, 'X[4] <= 0.344\ngini = 0.48\nsamples = 15\nvalue = [6,
9]'),
 Text(49.44303797468355, 120.80000000000001, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(56.50632911392405, 120.80000000000001, 'X[2] <= 0.238\ngini = 0.496\nsamples = 11\nv
alue = [6, 5]'),
 Text(52.9746835443038, 72.48000000000002, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(60.037974683544306, 72.48000000000002, 'X[3] <= 0.112\ngini = 0.444\nsamples = 9\nva
lue = [6, 3]'),
 Text(56.50632911392405, 24.159999999999968, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(63.56962025316456, 24.159999999999968, 'gini = 0.245\nsamples = 7\nvalue = [6, 1]'),
 Text(60.037974683544306, 169.12, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(67.10126582278481, 265.76, 'X[0] <= 0.378\ngini = 0.48\nsamples = 10\nvalue = [6,
4]'),
 Text(63.56962025316456, 217.44, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(70.63291139240506, 217.44, 'X[4] <= 0.532\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(67.10126582278481, 169.12, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(74.16455696202532, 169.12, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(181.65901898734177, 314.08, 'X[1] <= 0.206\ngini = 0.3\nsamples = 1176\nvalue = [96
0, 216]'),
 Text(116.9857594936709, 265.76, 'X[0] <= 0.528\ngini = 0.179\nsamples = 675\nvalue = [60
8, 67]'),
 Text(90.05696202531647, 217.44, 'X[4] <= 0.499\ngini = 0.465\nsamples = 49\nvalue = [31,
18]'),
 Text(81.22784810126582, 169.12, 'X[3] <= 0.157\ngini = 0.257\nsamples = 33\nvalue = [28,
5]'),
 Text(74.16455696202532, 120.80000000000001, 'X[3] <= 0.083\ngini = 0.32\nsamples = 5\nval
ue = [1, 4]'),
 Text(70.63291139240506, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(77.69620253164557, 72.48000000000002, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(88.29113924050634, 120.80000000000001, 'X[2] <= 0.174\ngini = 0.069\nsamples = 28\nv
alue = [27, 1]'),
 Text(84.75949367088609, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(91.82278481012659, 72.48000000000002, 'gini = 0.0\nsamples = 27\nvalue = [27, 0]'),
 Text(98.8860759493671, 169.12, 'X[3] <= 0.413\ngini = 0.305\nsamples = 16\nvalue = [3, 1
```

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3]'),
 Text(95.35443037974684, 120.80000000000001, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(102.41772151898735, 120.80000000000001, 'X[0] <= 0.504\ngini = 0.375\nsamples = 4\nv
alue = [3, 1]'),
 Text(98.8860759493671, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(105.9493670886076, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(143.91455696202533, 217.44, 'X[0] <= 0.837\ngini = 0.144\nsamples = 626\nvalue = [57
7, 49]'),
 Text(128.90506329113924, 169.12, 'X[4] <= 0.804\ngini = 0.109\nsamples = 569\nvalue = [53
6, 33]'),
 Text(120.07594936708861, 120.80000000000001, 'X[4] <= 0.67\ngini = 0.095\nsamples = 561\n
value = [533, 28]'),
 Text(113.0126582278481, 72.48000000000002, 'X[0] <= 0.805\ngini = 0.051\nsamples = 458\nv
alue = [446, 12]'),
 Text(109.48101265822785, 24.159999999999968, 'gini = 0.04\nsamples = 437\nvalue = [428,
9]'),
 Text(116.54430379746836, 24.159999999999968, 'gini = 0.245\nsamples = 21\nvalue = [18,
3]'),
 Text(127.13924050632912, 72.48000000000002, 'X[3] <= 0.595\ngini = 0.262\nsamples = 103\n
value = [87, 16]'),
 Text(123.60759493670886, 24.159999999999968, 'gini = 0.473\nsamples = 13\nvalue = [5,
8]'),
 Text(130.67088607594937, 24.159999999999968, 'gini = 0.162\nsamples = 90\nvalue = [82,
8]'),
 Text(137.73417721518987, 120.80000000000001, 'X[0] <= 0.757\ngini = 0.469\nsamples = 8\nv
alue = [3, 5]'),
 Text(134.20253164556962, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(141.26582278481013, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(158.9240506329114, 169.12, 'X[2] <= 0.458\ngini = 0.404\nsamples = 57\nvalue = [41,
16]'),
 Text(151.86075949367088, 120.80000000000001, 'X[4] <= 0.704\ngini = 0.499\nsamples = 19\n
value = [9, 10]'),
 Text(148.32911392405063, 72.48000000000002, 'X[3] <= 0.466\ngini = 0.408\nsamples = 14\nv
alue = [4, 10]'),
 Text(144.79746835443038, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(151.86075949367088, 24.159999999999968, 'gini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(155.39240506329114, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(165.9873417721519, 120.80000000000001, 'X[1] <= 0.197\ngini = 0.266\nsamples = 38\nv
alue = [32, 6]'),
 Text(162.45569620253164, 72.48000000000002, 'X[0] <= 0.84\ngini = 0.234\nsamples = 37\nva
lue = [32, 5]'),
 Text(158.9240506329114, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(165.9873417721519, 24.159999999999968, 'gini = 0.198\nsamples = 36\nvalue = [32,
4]'),
 Text(169.51898734177217, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(246.33227848101268, 265.76, 'X[4] <= 0.644\ngini = 0.418\nsamples = 501\nvalue = [35
2, 149]'),
 Text(212.78164556962025, 217.44, 'X[0] <= 0.698\ngini = 0.333\nsamples = 355\nvalue = [28
0, 75]'),
 Text(196.00632911392407, 169.12, 'X[0] <= 0.508\ngini = 0.252\nsamples = 284\nvalue = [24
2, 42]'),
 Text(183.64556962025318, 120.80000000000001, 'X[3] <= 0.321\ngini = 0.468\nsamples = 75\n
value = [47, 28]'),
 Text(176.58227848101268, 72.48000000000002, 'X[1] <= 0.237\ngini = 0.476\nsamples = 41\nv
alue = [16, 25]'),
 Text(173.05063291139243, 24.159999999999968, 'gini = 0.219\nsamples = 16\nvalue = [2, 1
4]'),
 Text(180.11392405063293, 24.159999999999968, 'gini = 0.493\nsamples = 25\nvalue = [14, 1
1]'),
 Text(190.7088607594937, 72.48000000000002, 'X[2] <= 0.836\ngini = 0.161\nsamples = 34\nva
lue = [31, 3]'),
 Text(187.17721518987344, 24.159999999999968, 'gini = 0.114\nsamples = 33\nvalue = [31,
2]'),
 Text(194.24050632911394, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(208.36708860759495, 120.80000000000001, 'X[1] <= 0.287\ngini = 0.125\nsamples = 209
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\nvalue = [195, 14]'),
 Text(204.8354430379747, 72.48000000000002, 'X[4] <= 0.521\ngini = 0.117\nsamples = 208\nv
alue = [195, 13]'),
 Text(201.30379746835445, 24.159999999999968, 'gini = 0.214\nsamples = 82\nvalue = [72, 1
0]'),
 Text(208.36708860759495, 24.159999999999968, 'gini = 0.046\nsamples = 126\nvalue = [123,
3]'),
 Text(211.8987341772152, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(229.55696202531647, 169.12, 'X[4] <= 0.517\ngini = 0.498\nsamples = 71\nvalue = [38,
33]'),
 Text(222.49367088607596, 120.80000000000001, 'X[0] <= 0.969\ngini = 0.184\nsamples = 39\n
value = [35, 4]'),
 Text(218.9620253164557, 72.48000000000002, 'X[3] <= 0.637\ngini = 0.145\nsamples = 38\nva
lue = [35, 3]'),
 Text(215.43037974683546, 24.159999999999968, 'gini = 0.059\nsamples = 33\nvalue = [32,
1]'),
 Text(222.49367088607596, 24.159999999999968, 'gini = 0.48\nsamples = 5\nvalue = [3, 2]'),
 Text(226.0253164556962, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(236.62025316455697, 120.80000000000001, 'X[3] <= 0.295\ngini = 0.17\nsamples = 32\nv
alue = [3, 29]'),
 Text(233.08860759493672, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(240.15189873417722, 72.48000000000002, 'gini = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(279.88291139240505, 217.44, 'X[3] <= 0.603\ngini = 0.5\nsamples = 146\nvalue = [72,
74]'),
 Text(259.57594936708864, 169.12, 'X[0] <= 0.687\ngini = 0.412\nsamples = 62\nvalue = [18,
44]'),
 Text(250.74683544303798, 120.80000000000001, 'X[4] <= 0.67\ngini = 0.114\nsamples = 33\nv
alue = [2, 31]'),
 Text(247.21518987341773, 72.48000000000002, 'X[1] <= 0.243\ngini = 0.48\nsamples = 5\nval
ue = [2, 3]'),
 Text(243.68354430379748, 24.159999999999968, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(250.74683544303798, 24.159999999999968, 'gini = 0.444\nsamples = 3\nvalue = [2,
1]'),
 Text(254.27848101265823, 72.48000000000002, 'gini = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(268.40506329113924, 120.80000000000001, 'X[2] <= 0.398\ngini = 0.495\nsamples = 29\n
value = [16, 13]'),
 Text(261.34177215189874, 72.48000000000002, 'X[0] <= 0.8\ngini = 0.32\nsamples = 10\nvalu
e = [2, 8]'),
 Text(257.8101265822785, 24.159999999999968, 'gini = 0.198\nsamples = 9\nvalue = [1, 8]'),
 Text(264.873417721519, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(275.46835443037975, 72.48000000000002, 'X[4] <= 0.682\ngini = 0.388\nsamples = 19\nv
alue = [14, 5]'),
 Text(271.9367088607595, 24.159999999999968, 'gini = 0.5\nsamples = 8\nvalue = [4, 4]'),
 Text(279.0, 24.159999999999968, 'gini = 0.165\nsamples = 11\nvalue = [10, 1]'),
 Text(300.1898734177215, 169.12, 'X[0] <= 0.825\ngini = 0.459\nsamples = 84\nvalue = [54,
30]'),
 Text(296.65822784810126, 120.80000000000001, 'X[4] <= 0.856\ngini = 0.444\nsamples = 81\n
value = [54, 27]'),
 Text(289.59493670886076, 72.48000000000002, 'X[4] <= 0.811\ngini = 0.429\nsamples = 77\nv
alue = [53, 24]'),
 Text(286.0632911392405, 24.159999999999968, 'gini = 0.448\nsamples = 71\nvalue = [47, 2
4]'),
 Text(293.126582278481, 24.159999999999968, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(303.72151898734177, 72.48000000000002, 'X[3] <= 0.665\ngini = 0.375\nsamples = 4\nva
lue = [1, 3]'),
 Text(300.1898734177215, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(307.253164556962, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(303.72151898734177, 120.80000000000001, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(495.42365506329116, 362.4, 'X[0] <= 0.405\ngini = 0.397\nsamples = 6068\nvalue = [16
58, 4410]'),
 Text(366.1875, 314.08, 'X[3] <= 0.193\ngini = 0.189\nsamples = 1996\nvalue = [211, 178
5]'),
 Text(330.2088607594937, 265.76, 'X[1] <= 0.634\ngini = 0.427\nsamples = 55\nvalue = [38,
17]'),
 Text(321.37974683544303, 217.44, 'X[4] <= 0.356\ngini = 0.273\nsamples = 43\nvalue = [36,
7]'),
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 Text(314.3164556962025, 169.12, 'X[0] <= 0.289\ngini = 0.408\nsamples = 7\nvalue = [2,
5]'),
 Text(310.7848101265823, 120.80000000000001, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(317.8481012658228, 120.80000000000001, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(328.44303797468353, 169.12, 'X[4] <= 0.468\ngini = 0.105\nsamples = 36\nvalue = [34,
2]'),
 Text(324.9113924050633, 120.80000000000001, 'gini = 0.0\nsamples = 26\nvalue = [26, 0]'),
 Text(331.9746835443038, 120.80000000000001, 'X[2] <= 0.843\ngini = 0.32\nsamples = 10\nva
lue = [8, 2]'),
 Text(328.44303797468353, 72.48000000000002, 'X[3] <= 0.047\ngini = 0.198\nsamples = 9\nva
lue = [8, 1]'),
 Text(324.9113924050633, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(331.9746835443038, 24.159999999999968, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(335.50632911392404, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(339.03797468354435, 217.44, 'X[3] <= 0.186\ngini = 0.278\nsamples = 12\nvalue = [2,
10]'),
 Text(335.50632911392404, 169.12, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(342.5696202531646, 169.12, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(402.16613924050637, 265.76, 'X[4] <= 0.374\ngini = 0.162\nsamples = 1941\nvalue = [1
73, 1768]'),
 Text(369.9398734177215, 217.44, 'X[0] <= 0.3\ngini = 0.093\nsamples = 1209\nvalue = [59,
1150]'),
 Text(358.4620253164557, 169.12, 'X[3] <= 0.97\ngini = 0.048\nsamples = 572\nvalue = [14,
558]'),
 Text(349.6329113924051, 120.80000000000001, 'X[1] <= 0.759\ngini = 0.045\nsamples = 570\n
value = [13, 557]'),
 Text(342.5696202531646, 72.48000000000002, 'X[4] <= 0.089\ngini = 0.025\nsamples = 480\nv
alue = [6, 474]'),
 Text(339.03797468354435, 24.159999999999968, 'gini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(346.10126582278485, 24.159999999999968, 'gini = 0.021\nsamples = 477\nvalue = [5, 47
2]'),
 Text(356.6962025316456, 72.48000000000002, 'X[3] <= 0.599\ngini = 0.143\nsamples = 90\nva
lue = [7, 83]'),
 Text(353.16455696202536, 24.159999999999968, 'gini = 0.375\nsamples = 4\nvalue = [3,
1]'),
 Text(360.22784810126586, 24.159999999999968, 'gini = 0.089\nsamples = 86\nvalue = [4, 8
2]'),
 Text(367.29113924050637, 120.80000000000001, 'X[0] <= 0.278\ngini = 0.5\nsamples = 2\nval
ue = [1, 1]'),
 Text(363.7594936708861, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(370.8227848101266, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(381.4177215189874, 169.12, 'X[0] <= 0.3\ngini = 0.131\nsamples = 637\nvalue = [45, 5
92]'),
 Text(377.8860759493671, 120.80000000000001, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(384.94936708860763, 120.80000000000001, 'X[3] <= 0.578\ngini = 0.129\nsamples = 636
\nvalue = [44, 592]'),
 Text(377.8860759493671, 72.48000000000002, 'X[1] <= 0.73\ngini = 0.179\nsamples = 342\nva
lue = [34, 308]'),
 Text(374.3544303797469, 24.159999999999968, 'gini = 0.157\nsamples = 337\nvalue = [29, 30
8]'),
 Text(381.4177215189874, 24.159999999999968, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(392.01265822784814, 72.48000000000002, 'X[1] <= 0.89\ngini = 0.066\nsamples = 294\nv
alue = [10, 284]'),
 Text(388.4810126582279, 24.159999999999968, 'gini = 0.049\nsamples = 280\nvalue = [7, 27
3]'),
 Text(395.5443037974684, 24.159999999999968, 'gini = 0.337\nsamples = 14\nvalue = [3, 1
1]'),
 Text(434.39240506329116, 217.44, 'X[1] <= 0.513\ngini = 0.263\nsamples = 732\nvalue = [11
4, 618]'),
 Text(411.4367088607595, 169.12, 'X[3] <= 0.237\ngini = 0.187\nsamples = 441\nvalue = [46,
395]'),
 Text(402.6075949367089, 120.80000000000001, 'X[3] <= 0.2\ngini = 0.473\nsamples = 13\nval
ue = [8, 5]'),
 Text(399.07594936708864, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(406.13924050632914, 72.48000000000002, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
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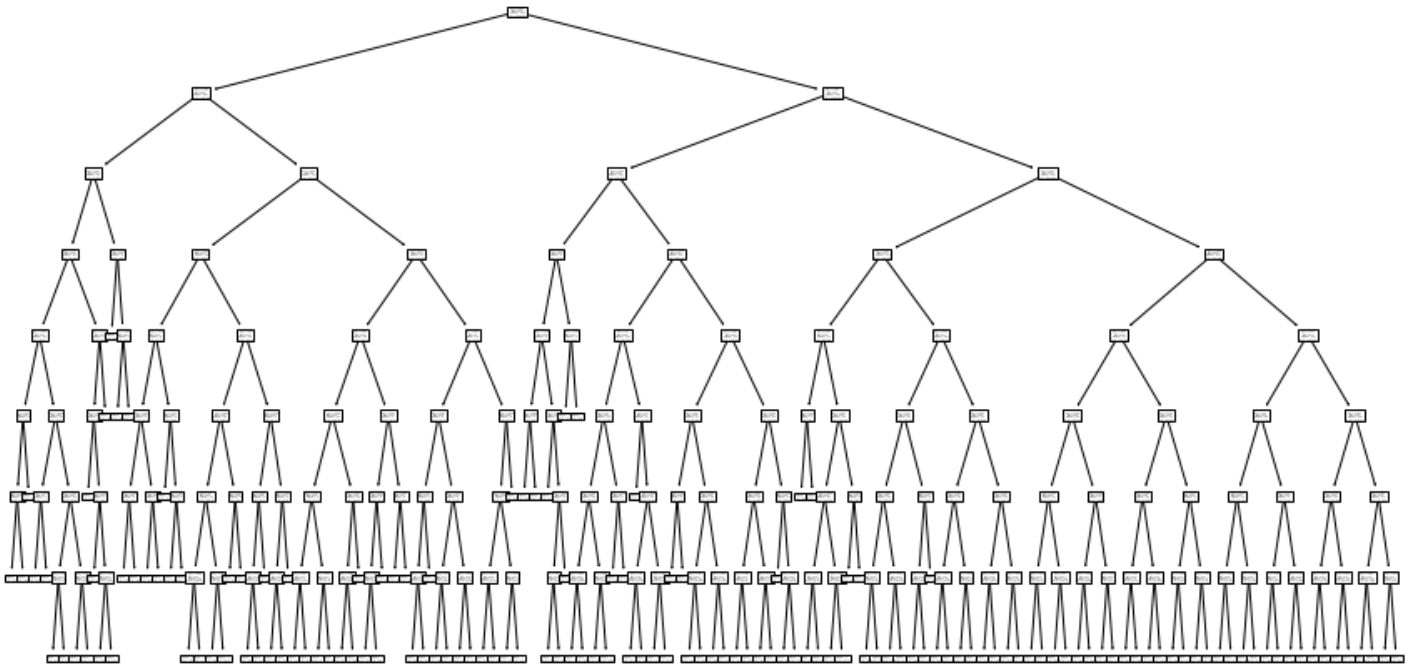
 Text(420.26582278481015, 120.80000000000001, 'X[0] <= 0.325\ngini = 0.162\nsamples = 428
\nvalue = [38, 390]'),
 Text(413.20253164556965, 72.48000000000002, 'X[2] <= 0.737\ngini = 0.094\nsamples = 242\n
value = [12, 230]'),
 Text(409.6708860759494, 24.159999999999968, 'gini = 0.054\nsamples = 215\nvalue = [6, 20
9]'),
 Text(416.7341772151899, 24.159999999999968, 'gini = 0.346\nsamples = 27\nvalue = [6, 2
1]'),
 Text(427.32911392405066, 72.48000000000002, 'X[4] <= 0.456\ngini = 0.24\nsamples = 186\nv
alue = [26, 160]'),
 Text(423.7974683544304, 24.159999999999968, 'gini = 0.124\nsamples = 90\nvalue = [6, 8
4]'),
 Text(430.8607594936709, 24.159999999999968, 'gini = 0.33\nsamples = 96\nvalue = [20, 7
6]'),
 Text(457.34810126582283, 169.12, 'X[4] <= 0.604\ngini = 0.358\nsamples = 291\nvalue = [6
8, 223]'),
 Text(448.5189873417722, 120.80000000000001, 'X[3] <= 0.513\ngini = 0.454\nsamples = 184\n
value = [64, 120]'),
 Text(441.45569620253167, 72.48000000000002, 'X[1] <= 0.755\ngini = 0.441\nsamples = 73\nv
alue = [49, 24]'),
 Text(437.9240506329114, 24.159999999999968, 'gini = 0.282\nsamples = 53\nvalue = [44,
9]'),
 Text(444.9873417721519, 24.159999999999968, 'gini = 0.375\nsamples = 20\nvalue = [5, 1
5]'),
 Text(455.5822784810127, 72.48000000000002, 'X[1] <= 0.671\ngini = 0.234\nsamples = 111\nv
alue = [15, 96]'),
 Text(452.0506329113924, 24.159999999999968, 'gini = 0.112\nsamples = 84\nvalue = [5, 7
9]'),
 Text(459.11392405063293, 24.159999999999968, 'gini = 0.466\nsamples = 27\nvalue = [10, 1
7]'),
 Text(466.17721518987344, 120.80000000000001, 'X[2] <= 0.113\ngini = 0.072\nsamples = 107
\nvalue = [4, 103]'),
 Text(462.6455696202532, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(469.7088607594937, 72.48000000000002, 'X[0] <= 0.253\ngini = 0.055\nsamples = 106\nv
alue = [3, 103]'),
 Text(466.17721518987344, 24.159999999999968, 'gini = 0.444\nsamples = 6\nvalue = [2,
4]'),
 Text(473.24050632911394, 24.159999999999968, 'gini = 0.02\nsamples = 100\nvalue = [1, 9
9]'),
 Text(624.6598101265823, 314.08, 'X[4] <= 0.426\ngini = 0.458\nsamples = 4072\nvalue = [14
47, 2625]'),
 Text(525.3322784810127, 265.76, 'X[0] <= 0.485\ngini = 0.475\nsamples = 1473\nvalue = [90
0, 573]'),
 Text(490.01582278481015, 217.44, 'X[3] <= 0.197\ngini = 0.403\nsamples = 447\nvalue = [12
5, 322]'),
 Text(480.30379746835445, 169.12, 'X[0] <= 0.446\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(476.7721518987342, 120.80000000000001, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(483.8354430379747, 120.80000000000001, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(499.72784810126586, 169.12, 'X[1] <= 0.866\ngini = 0.395\nsamples = 440\nvalue = [11
9, 321]'),
 Text(490.8987341772152, 120.80000000000001, 'X[4] <= 0.235\ngini = 0.387\nsamples = 434\n
value = [114, 320]'),
 Text(483.8354430379747, 72.48000000000002, 'X[1] <= 0.412\ngini = 0.233\nsamples = 89\nva
lue = [12, 77]'),
 Text(480.30379746835445, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(487.36708860759495, 24.159999999999968, 'gini = 0.187\nsamples = 86\nvalue = [9, 7
7]'),
 Text(497.9620253164557, 72.48000000000002, 'X[1] <= 0.682\ngini = 0.416\nsamples = 345\nv
alue = [102, 243]'),
 Text(494.43037974683546, 24.159999999999968, 'gini = 0.382\nsamples = 303\nvalue = [78, 2
25]'),
 Text(501.49367088607596, 24.159999999999968, 'gini = 0.49\nsamples = 42\nvalue = [24, 1
8]'),
 Text(508.55696202531647, 120.80000000000001, 'X[1] <= 0.934\ngini = 0.278\nsamples = 6\nv
alue = [5, 1]'),
```

```
 Text(505.0253164556962, 72.48000000000002, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(512.0886075949368, 72.48000000000002, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(560.6487341772153, 217.44, 'X[3] <= 0.449\ngini = 0.37\nsamples = 1026\nvalue = [77
5, 251]'),
 Text(538.5759493670886, 169.12, 'X[1] <= 0.617\ngini = 0.488\nsamples = 281\nvalue = [16
2, 119]'),
 Text(526.2151898734178, 120.80000000000001, 'X[0] <= 0.525\ngini = 0.451\nsamples = 236\n
value = [155, 81]'),
 Text(519.1518987341773, 72.48000000000002, 'X[0] <= 0.49\ngini = 0.492\nsamples = 57\nval
ue = [25, 32]'),
 Text(515.620253164557, 24.159999999999968, 'gini = 0.298\nsamples = 11\nvalue = [9, 2]'),
 Text(522.6835443037975, 24.159999999999968, 'gini = 0.454\nsamples = 46\nvalue = [16, 3
0]'),
 Text(533.2784810126583, 72.48000000000002, 'X[1] <= 0.462\ngini = 0.398\nsamples = 179\nv
alue = [130, 49]'),
 Text(529.746835443038, 24.159999999999968, 'gini = 0.309\nsamples = 115\nvalue = [93, 2
2]'),
 Text(536.8101265822785, 24.159999999999968, 'gini = 0.488\nsamples = 64\nvalue = [37, 2
7]'),
 Text(550.9367088607595, 120.80000000000001, 'X[3] <= 0.423\ngini = 0.263\nsamples = 45\nv
alue = [7, 38]'),
 Text(547.4050632911393, 72.48000000000002, 'X[2] <= 0.783\ngini = 0.172\nsamples = 42\nva
lue = [4, 38]'),
 Text(543.873417721519, 24.159999999999968, 'gini = 0.136\nsamples = 41\nvalue = [3, 3
8]'),
 Text(550.9367088607595, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(554.4683544303798, 72.48000000000002, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(582.7215189873418, 169.12, 'X[0] <= 0.544\ngini = 0.292\nsamples = 745\nvalue = [61
3, 132]'),
 Text(568.5949367088608, 120.80000000000001, 'X[3] <= 0.718\ngini = 0.468\nsamples = 155\n
value = [97, 58]'),
 Text(561.5316455696203, 72.48000000000002, 'X[4] <= 0.413\ngini = 0.45\nsamples = 143\nva
lue = [94, 49]'),
 Text(558.0, 24.159999999999968, 'gini = 0.432\nsamples = 136\nvalue = [93, 43]'),
 Text(565.0632911392405, 24.159999999999968, 'gini = 0.245\nsamples = 7\nvalue = [1, 6]'),
 Text(575.6582278481013, 72.48000000000002, 'X[1] <= 0.654\ngini = 0.375\nsamples = 12\nva
lue = [3, 9]'),
 Text(572.126582278481, 24.159999999999968, 'gini = 0.375\nsamples = 4\nvalue = [3, 1]'),
 Text(579.1898734177215, 24.159999999999968, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(596.8481012658228, 120.80000000000001, 'X[4] <= 0.367\ngini = 0.219\nsamples = 590\n
value = [516, 74]'),
 Text(589.7848101265823, 72.48000000000002, 'X[0] <= 0.577\ngini = 0.129\nsamples = 461\nv
alue = [429, 32]'),
 Text(586.253164556962, 24.159999999999968, 'gini = 0.355\nsamples = 52\nvalue = [40, 1
2]'),
 Text(593.3164556962025, 24.159999999999968, 'gini = 0.093\nsamples = 409\nvalue = [389, 2
0]'),
 Text(603.9113924050633, 72.48000000000002, 'X[0] <= 0.834\ngini = 0.439\nsamples = 129\nv
alue = [87, 42]'),
 Text(600.379746835443, 24.159999999999968, 'gini = 0.405\nsamples = 117\nvalue = [84, 3
3]'),
 Text(607.4430379746835, 24.159999999999968, 'gini = 0.375\nsamples = 12\nvalue = [3,
9]'),
 Text(723.9873417721519, 265.76, 'X[1] <= 0.386\ngini = 0.332\nsamples = 2599\nvalue = [54
7, 2052]'),
 Text(667.4810126582279, 217.44, 'X[0] <= 0.597\ngini = 0.473\nsamples = 677\nvalue = [26
0, 417]'),
 Text(639.2278481012659, 169.12, 'X[4] <= 0.726\ngini = 0.482\nsamples = 316\nvalue = [18
8, 128]'),
 Text(625.1012658227849, 120.80000000000001, 'X[4] <= 0.492\ngini = 0.399\nsamples = 251\n
value = [182, 69]'),
 Text(618.0379746835443, 72.48000000000002, 'X[3] <= 0.224\ngini = 0.498\nsamples = 47\nva
lue = [22, 25]'),
 Text(614.506329113924, 24.159999999999968, 'gini = 0.0\nsamples = 11\nvalue = [11, 0]'),
 Text(621.5696202531645, 24.159999999999968, 'gini = 0.424\nsamples = 36\nvalue = [11, 2
5]'),
```

```
 Text(632.1645569620254, 72.48000000000002, 'X[4] <= 0.67\ngini = 0.338\nsamples = 204\nva
lue = [160, 44]'),
 Text(628.632911392405, 24.159999999999968, 'gini = 0.275\nsamples = 170\nvalue = [142, 2
8]'),
 Text(635.6962025316456, 24.159999999999968, 'gini = 0.498\nsamples = 34\nvalue = [18, 1
6]'),
 Text(653.3544303797469, 120.80000000000001, 'X[3] <= 0.795\ngini = 0.168\nsamples = 65\nv
alue = [6, 59]'),
 Text(646.2911392405064, 72.48000000000002, 'X[3] <= 0.305\ngini = 0.071\nsamples = 54\nva
lue = [2, 52]'),
 Text(642.7594936708861, 24.159999999999968, 'gini = 0.48\nsamples = 5\nvalue = [2, 3]'),
 Text(649.8227848101266, 24.159999999999968, 'gini = 0.0\nsamples = 49\nvalue = [0, 49]'),
 Text(660.4177215189874, 72.48000000000002, 'X[4] <= 0.742\ngini = 0.463\nsamples = 11\nva
lue = [4, 7]'),
 Text(656.8860759493671, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(663.9493670886076, 24.159999999999968, 'gini = 0.219\nsamples = 8\nvalue = [1, 7]'),
 Text(695.7341772151899, 169.12, 'X[4] <= 0.734\ngini = 0.319\nsamples = 361\nvalue = [72,
289]'),
 Text(681.6075949367089, 120.80000000000001, 'X[3] <= 0.393\ngini = 0.28\nsamples = 332\nv
alue = [56, 276]'),
 Text(674.5443037974684, 72.48000000000002, 'X[1] <= 0.335\ngini = 0.484\nsamples = 68\nva
lue = [28, 40]'),
 Text(671.0126582278481, 24.159999999999968, 'gini = 0.482\nsamples = 32\nvalue = [19, 1
3]'),
 Text(678.0759493670887, 24.159999999999968, 'gini = 0.375\nsamples = 36\nvalue = [9, 2
7]'),
 Text(688.6708860759494, 72.48000000000002, 'X[0] <= 0.652\ngini = 0.19\nsamples = 264\nva
lue = [28, 236]'),
 Text(685.1392405063292, 24.159999999999968, 'gini = 0.408\nsamples = 70\nvalue = [20, 5
0]'),
 Text(692.2025316455697, 24.159999999999968, 'gini = 0.079\nsamples = 194\nvalue = [8, 18
6]'),
 Text(709.8607594936709, 120.80000000000001, 'X[0] <= 0.627\ngini = 0.495\nsamples = 29\nv
alue = [16, 13]'),
 Text(702.7974683544304, 72.48000000000002, 'X[3] <= 0.785\ngini = 0.198\nsamples = 9\nval
ue = [1, 8]'),
 Text(699.2658227848102, 24.159999999999968, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(706.3291139240507, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(716.9240506329114, 72.48000000000002, 'X[4] <= 0.769\ngini = 0.375\nsamples = 20\nva
lue = [15, 5]'),
 Text(713.3924050632912, 24.159999999999968, 'gini = 0.496\nsamples = 11\nvalue = [6,
5]'),
 Text(720.4556962025317, 24.159999999999968, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(780.493670886076, 217.44, 'X[4] <= 0.472\ngini = 0.254\nsamples = 1922\nvalue = [28
7, 1635]'),
 Text(752.2405063291139, 169.12, 'X[1] <= 0.66\ngini = 0.435\nsamples = 238\nvalue = [76,
162]'),
 Text(738.1139240506329, 120.80000000000001, 'X[0] <= 0.662\ngini = 0.473\nsamples = 172\n
value = [66, 106]'),
 Text(731.0506329113924, 72.48000000000002, 'X[3] <= 0.442\ngini = 0.499\nsamples = 92\nva
lue = [48, 44]'),
 Text(727.5189873417722, 24.159999999999968, 'gini = 0.337\nsamples = 28\nvalue = [22,
6]'),
 Text(734.5822784810127, 24.159999999999968, 'gini = 0.482\nsamples = 64\nvalue = [26, 3
8]'),
 Text(745.1772151898734, 72.48000000000002, 'X[1] <= 0.423\ngini = 0.349\nsamples = 80\nva
lue = [18, 62]'),
 Text(741.6455696202532, 24.159999999999968, 'gini = 0.469\nsamples = 8\nvalue = [5, 3]'),
 Text(748.7088607594937, 24.159999999999968, 'gini = 0.296\nsamples = 72\nvalue = [13, 5
9]'),
 Text(766.367088607595, 120.80000000000001, 'X[4] <= 0.43\ngini = 0.257\nsamples = 66\nval
ue = [10, 56]'),
 Text(759.3037974683544, 72.48000000000002, 'X[1] <= 0.689\ngini = 0.5\nsamples = 6\nvalue
= [3, 3]'),
 Text(755.7721518987343, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(762.8354430379748, 24.159999999999968, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
```

```
 Text(773.4303797468355, 72.48000000000002, 'X[4] <= 0.472\ngini = 0.206\nsamples = 60\nva
lue = [7, 53]'),
 Text(769.8987341772153, 24.159999999999968, 'gini = 0.183\nsamples = 59\nvalue = [6, 5
3]'),
 Text(776.9620253164558, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(808.746835443038, 169.12, 'X[0] <= 0.527\ngini = 0.219\nsamples = 1684\nvalue = [21
1, 1473]'),
 Text(794.620253164557, 120.80000000000001, 'X[1] <= 0.476\ngini = 0.329\nsamples = 573\nv
alue = [119, 454]'),
 Text(787.5569620253165, 72.48000000000002, 'X[4] <= 0.667\ngini = 0.494\nsamples = 150\nv
alue = [67, 83]'),
 Text(784.0253164556963, 24.159999999999968, 'gini = 0.407\nsamples = 81\nvalue = [58, 2
3]'),
 Text(791.0886075949368, 24.159999999999968, 'gini = 0.227\nsamples = 69\nvalue = [9, 6
0]'),
 Text(801.6835443037975, 72.48000000000002, 'X[4] <= 0.496\ngini = 0.216\nsamples = 423\nv
alue = [52, 371]'),
 Text(798.1518987341773, 24.159999999999968, 'gini = 0.459\nsamples = 28\nvalue = [10, 1
8]'),
 Text(805.2151898734178, 24.159999999999968, 'gini = 0.19\nsamples = 395\nvalue = [42, 35
3]'),
 Text(822.873417721519, 120.80000000000001, 'X[4] <= 0.794\ngini = 0.152\nsamples = 1111\n
value = [92, 1019]'),
 Text(815.8101265822785, 72.48000000000002, 'X[3] <= 0.116\ngini = 0.145\nsamples = 1105\n
value = [87, 1018]'),
 Text(812.2784810126583, 24.159999999999968, 'gini = 0.496\nsamples = 11\nvalue = [5,
6]'),
 Text(819.3417721518988, 24.159999999999968, 'gini = 0.139\nsamples = 1094\nvalue = [82, 1
012]'),
 Text(829.9367088607595, 72.48000000000002, 'X[3] <= 0.672\ngini = 0.278\nsamples = 6\nval
ue = [5, 1]'),
 Text(826.4050632911393, 24.159999999999968, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(833.4683544303798, 24.159999999999968, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]')]
```



In [143…

```
dotfile = open("data/tree_max_depth_gini.dot", 'w')
tree.export_graphviz(clf3, out_file = dotfile, feature_names = xtrain.columns)
dotfile.close()
```

In [38]:

```
ypred3 = clf3.predict(xtest)
```

In [39]:
```
scores3 = cross_val_score(clf3, xtrain, ytrain, cv=5)
scores3
```

Out[39]:
```
array([0.84072581, 0.8266129 , 0.83736559, 0.84129119, 0.83053127])
```

In [40]:
```
print("%0.4f accuracy with a standard deviation of %0.4f" % (scores3.mean(), scores3.std()
```

```
0.8353 accuracy with a standard deviation of 0.0058
```

In [41]:
```
hyperparameters = hyperparameters.append({'hyperparameters':'max_depth + gini', 'accuracy'
```

entropy

Hyperparameter kritérium entropy kontroluje "impurity" elementov rozhodovacieho stromu. Element stromu rozdeľude ďalej až do bodu, kým sa v elemente nenachádza žiadna "impurity", potom sa stane z takéhoto elementu list stromu.

In [42]:
```
clf4 = tree.DecisionTreeClassifier(criterion='entropy')
clf4 = clf4.fit(xtrain, ytrain)
plt.figure(figsize=(15,8))
tree.plot_tree(clf4)
```

Out[42]:
```
[Text(239.00630385309117, 426.1824, 'X[0] <= 0.422\nentropy = 0.938\nsamples = 7438\nvalue
= [2636, 4802]'),
 Text(81.50363648865945, 408.7872, 'X[4] <= 0.343\nentropy = 0.513\nsamples = 2370\nvalue
= [271, 2099]'),
 Text(39.63282836831415, 391.392, 'X[0] <= 0.404\nentropy = 0.301\nsamples = 1122\nvalue =
[60, 1062]'),
 Text(26.56355788761002, 373.9968, 'X[3] <= 0.617\nentropy = 0.259\nsamples = 1028\nvalue
= [45, 983]'),
 Text(15.158937034529453, 356.6016, 'X[1] <= 0.713\nentropy = 0.322\nsamples = 596\nvalue
= [35, 561]'),
 Text(7.6503046716316865, 339.20640000000003, 'X[3] <= 0.196\nentropy = 0.266\nsamples = 5
75\nvalue = [26, 549]'),
 Text(3.400135409614083, 321.8112, 'X[3] <= 0.181\nentropy = 0.881\nsamples = 10\nvalue =
[3, 7]'),
 Text(2.266756939742722, 304.416, 'X[1] <= 0.22\nentropy = 0.544\nsamples = 8\nvalue = [1,
7]'),
 Text(1.133378469871361, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(3.400135409614083, 287.0208, 'entropy = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(4.533513879485444, 304.416, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(11.90047393364929, 321.8112, 'X[0] <= 0.306\nentropy = 0.246\nsamples = 565\nvalue =
[23, 542]'),
 Text(7.9336492890995265, 304.416, 'X[4] <= 0.169\nentropy = 0.09\nsamples = 264\nvalue =
[3, 261]'),
 Text(5.666892349356805, 287.0208, 'X[0] <= 0.198\nentropy = 0.619\nsamples = 13\nvalue =
[2, 11]'),
 Text(4.533513879485444, 269.62559999999996, 'X[4] <= 0.148\nentropy = 0.971\nsamples = 5
\nvalue = [2, 3]'),
 Text(3.400135409614083, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(5.666892349356805, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(6.800270819228166, 269.62559999999996, 'entropy = 0.0\nsamples = 8\nvalue = [0,
8]'),
 Text(10.200406228842247, 287.0208, 'X[0] <= 0.288\nentropy = 0.037\nsamples = 251\nvalue
= [1, 250]'),
 Text(9.067027758970887, 269.62559999999996, 'entropy = 0.0\nsamples = 201\nvalue = [0, 20
1]'),
 Text(11.33378469871361, 269.62559999999996, 'X[0] <= 0.288\nentropy = 0.141\nsamples = 50
\nvalue = [1, 49]'),
 Text(10.200406228842247, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
```

```
 Text(12.467163168584971, 252.2304, 'entropy = 0.0\nsamples = 49\nvalue = [0, 49]'),
 Text(15.867298578199053, 304.416, 'X[0] <= 0.307\nentropy = 0.353\nsamples = 301\nvalue =
[20, 281]'),
 Text(14.733920108327691, 287.0208, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(17.000677048070415, 287.0208, 'X[3] <= 0.578\nentropy = 0.328\nsamples = 299\nvalue
= [18, 281]'),
 Text(15.867298578199053, 269.62559999999996, 'X[4] <= 0.327\nentropy = 0.368\nsamples = 2
55\nvalue = [18, 237]'),
 Text(14.733920108327691, 252.2304, 'X[3] <= 0.576\nentropy = 0.41\nsamples = 219\nvalue =
[18, 201]'),
 Text(13.600541638456331, 234.83520000000001, 'X[4] <= 0.326\nentropy = 0.395\nsamples = 2
18\nvalue = [17, 201]'),
 Text(12.467163168584971, 217.44, 'X[1] <= 0.491\nentropy = 0.38\nsamples = 217\nvalue =
[16, 201]'),
 Text(9.633716993906567, 200.0448, 'X[3] <= 0.532\nentropy = 0.161\nsamples = 85\nvalue =
[2, 83]'),
 Text(8.500338524035207, 182.64960000000002, 'X[0] <= 0.395\nentropy = 0.093\nsamples = 84
\nvalue = [1, 83]'),
 Text(7.366960054163846, 165.25440000000003, 'entropy = 0.0\nsamples = 73\nvalue = [0, 7
3]'),
 Text(9.633716993906567, 165.25440000000003, 'X[0] <= 0.395\nentropy = 0.439\nsamples = 11
\nvalue = [1, 10]'),
 Text(8.500338524035207, 147.8592, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(10.76709546377793, 147.8592, 'entropy = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(10.76709546377793, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(15.300609343263373, 200.0448, 'X[0] <= 0.323\nentropy = 0.488\nsamples = 132\nvalue
= [14, 118]'),
 Text(14.167230873392011, 182.64960000000002, 'entropy = 0.0\nsamples = 24\nvalue = [0, 2
4]'),
 Text(16.433987813134735, 182.64960000000002, 'X[1] <= 0.608\nentropy = 0.556\nsamples = 1
08\nvalue = [14, 94]'),
 Text(15.300609343263373, 165.25440000000003, 'X[1] <= 0.592\nentropy = 0.624\nsamples = 9
0\nvalue = [14, 76]'),
 Text(13.033852403520651, 147.8592, 'X[1] <= 0.565\nentropy = 0.56\nsamples = 84\nvalue =
[11, 73]'),
 Text(11.90047393364929, 130.464, 'X[3] <= 0.363\nentropy = 0.656\nsamples = 65\nvalue =
[11, 54]'),
 Text(10.76709546377793, 113.06880000000001, 'entropy = 0.0\nsamples = 2\nvalue = [2,
0]'),
 Text(13.033852403520651, 113.06880000000001, 'X[3] <= 0.504\nentropy = 0.592\nsamples = 6
3\nvalue = [9, 54]'),
 Text(9.633716993906567, 95.67360000000002, 'X[0] <= 0.398\nentropy = 0.365\nsamples = 43
\nvalue = [3, 40]'),
 Text(8.500338524035207, 78.27840000000003, 'X[1] <= 0.491\nentropy = 0.276\nsamples = 42
\nvalue = [2, 40]'),
 Text(7.366960054163846, 60.88319999999999, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(9.633716993906567, 60.88319999999999, 'X[4] <= 0.134\nentropy = 0.165\nsamples = 41
\nvalue = [1, 40]'),
 Text(8.500338524035207, 43.488, 'X[1] <= 0.521\nentropy = 0.918\nsamples = 3\nvalue = [1,
2]'),
 Text(7.366960054163846, 26.09280000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(9.633716993906567, 26.09280000000001, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(10.76709546377793, 43.488, 'entropy = 0.0\nsamples = 38\nvalue = [0, 38]'),
 Text(10.76709546377793, 78.27840000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(16.433987813134735, 95.67360000000002, 'X[1] <= 0.562\nentropy = 0.881\nsamples = 20
\nvalue = [6, 14]'),
 Text(15.300609343263373, 78.27840000000003, 'X[1] <= 0.546\nentropy = 0.764\nsamples = 18
\nvalue = [4, 14]'),
 Text(14.167230873392011, 60.88319999999999, 'X[4] <= 0.322\nentropy = 0.918\nsamples = 12
\nvalue = [4, 8]'),
 Text(13.033852403520651, 43.488, 'X[0] <= 0.34\nentropy = 0.991\nsamples = 9\nvalue = [4,
5]'),
 Text(11.90047393364929, 26.09280000000001, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(14.167230873392011, 26.09280000000001, 'X[0] <= 0.358\nentropy = 0.863\nsamples = 7
\nvalue = [2, 5]'),
```

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 Text(13.033852403520651, 8.697600000000023, 'entropy = 0.0\nsamples = 5\nvalue = [0,
5]'),
 Text(15.300609343263373, 8.697600000000023, 'entropy = 0.0\nsamples = 2\nvalue = [2,
0]'),
 Text(15.300609343263373, 43.488, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(16.433987813134735, 60.88319999999999, 'entropy = 0.0\nsamples = 6\nvalue = [0,
6]'),
 Text(17.567366283006095, 78.27840000000003, 'entropy = 0.0\nsamples = 2\nvalue = [2,
0]'),
 Text(14.167230873392011, 130.464, 'entropy = 0.0\nsamples = 19\nvalue = [0, 19]'),
 Text(17.567366283006095, 147.8592, 'X[0] <= 0.365\nentropy = 1.0\nsamples = 6\nvalue =
[3, 3]'),
 Text(16.433987813134735, 130.464, 'X[3] <= 0.558\nentropy = 0.811\nsamples = 4\nvalue =
[3, 1]'),
 Text(15.300609343263373, 113.06880000000001, 'entropy = 0.0\nsamples = 3\nvalue = [3,
0]'),
 Text(17.567366283006095, 113.06880000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(18.700744752877455, 130.464, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(17.567366283006095, 165.25440000000003, 'entropy = 0.0\nsamples = 18\nvalue = [0, 1
8]'),
 Text(14.733920108327691, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(15.867298578199053, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(17.000677048070415, 252.2304, 'entropy = 0.0\nsamples = 36\nvalue = [0, 36]'),
 Text(18.134055517941775, 269.62559999999996, 'entropy = 0.0\nsamples = 44\nvalue = [0, 4
4]'),
 Text(22.66756939742722, 339.20640000000003, 'X[4] <= 0.212\nentropy = 0.985\nsamples = 21
\nvalue = [9, 12]'),
 Text(19.267433987813135, 321.8112, 'X[1] <= 0.719\nentropy = 0.65\nsamples = 12\nvalue =
[2, 10]'),
 Text(18.134055517941775, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(20.400812457684495, 304.416, 'X[3] <= 0.614\nentropy = 0.439\nsamples = 11\nvalue =
[1, 10]'),
 Text(19.267433987813135, 287.0208, 'entropy = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(21.53419092755586, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(26.067704807041302, 321.8112, 'X[4] <= 0.342\nentropy = 0.764\nsamples = 9\nvalue =
[7, 2]'),
 Text(24.934326337169942, 304.416, 'X[2] <= 0.335\nentropy = 0.544\nsamples = 8\nvalue =
[7, 1]'),
 Text(23.80094786729858, 287.0208, 'X[1] <= 0.767\nentropy = 1.0\nsamples = 2\nvalue = [1,
1]'),
 Text(22.66756939742722, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(24.934326337169942, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(26.067704807041302, 287.0208, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(27.201083276912662, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(37.96817874069059, 356.6016, 'X[1] <= 0.868\nentropy = 0.159\nsamples = 432\nvalue =
[10, 422]'),
 Text(32.86797562626947, 339.20640000000003, 'X[3] <= 0.732\nentropy = 0.099\nsamples = 38
9\nvalue = [5, 384]'),
 Text(30.601218686526746, 321.8112, 'X[0] <= 0.365\nentropy = 0.037\nsamples = 252\nvalue
= [1, 251]'),
 Text(29.467840216655382, 304.416, 'entropy = 0.0\nsamples = 213\nvalue = [0, 213]'),
 Text(31.734597156398106, 304.416, 'X[0] <= 0.367\nentropy = 0.172\nsamples = 39\nvalue =
[1, 38]'),
 Text(30.601218686526746, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(32.86797562626947, 287.0208, 'entropy = 0.0\nsamples = 38\nvalue = [0, 38]'),
 Text(35.13473256601219, 321.8112, 'X[3] <= 0.732\nentropy = 0.19\nsamples = 137\nvalue =
[4, 133]'),
 Text(34.00135409614083, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(36.26811103588355, 304.416, 'X[1] <= 0.771\nentropy = 0.153\nsamples = 136\nvalue =
[3, 133]'),
 Text(35.13473256601219, 287.0208, 'X[1] <= 0.761\nentropy = 0.267\nsamples = 66\nvalue =
[3, 63]'),
```

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 Text(34.00135409614083, 269.62559999999996, 'entropy = 0.0\nsamples = 53\nvalue = [0, 5
3]'),
 Text(36.26811103588355, 269.62559999999996, 'X[4] <= 0.288\nentropy = 0.779\nsamples = 13
\nvalue = [3, 10]'),
 Text(35.13473256601219, 252.2304, 'X[1] <= 0.769\nentropy = 0.439\nsamples = 11\nvalue =
[1, 10]'),
 Text(34.00135409614083, 234.83520000000001, 'entropy = 0.0\nsamples = 10\nvalue = [0, 1
0]'),
 Text(36.26811103588355, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(37.40148950575491, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(37.40148950575491, 287.0208, 'entropy = 0.0\nsamples = 70\nvalue = [0, 70]'),
 Text(43.06838185511172, 339.20640000000003, 'X[2] <= 0.433\nentropy = 0.519\nsamples = 43
\nvalue = [5, 38]'),
 Text(41.93500338524036, 321.8112, 'X[2] <= 0.422\nentropy = 0.811\nsamples = 20\nvalue =
[5, 15]'),
 Text(40.80162491536899, 304.416, 'X[3] <= 0.665\nentropy = 0.65\nsamples = 18\nvalue =
[3, 15]'),
 Text(39.66824644549763, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(41.93500338524036, 287.0208, 'X[3] <= 0.936\nentropy = 0.523\nsamples = 17\nvalue =
[2, 15]'),
 Text(40.80162491536899, 269.62559999999996, 'X[2] <= 0.25\nentropy = 0.337\nsamples = 16
\nvalue = [1, 15]'),
 Text(39.66824644549763, 252.2304, 'X[2] <= 0.237\nentropy = 0.811\nsamples = 4\nvalue =
[1, 3]'),
 Text(38.53486797562627, 234.83520000000001, 'entropy = 0.0\nsamples = 3\nvalue = [0,
3]'),
 Text(40.80162491536899, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(41.93500338524036, 252.2304, 'entropy = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(43.06838185511172, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(43.06838185511172, 304.416, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(44.20176032498308, 321.8112, 'entropy = 0.0\nsamples = 23\nvalue = [0, 23]'),
 Text(52.702098849018284, 373.9968, 'X[1] <= 0.812\nentropy = 0.633\nsamples = 94\nvalue =
[15, 79]'),
 Text(50.435341909275564, 356.6016, 'X[3] <= 0.558\nentropy = 0.556\nsamples = 85\nvalue =
[11, 74]'),
 Text(49.3019634394042, 339.20640000000003, 'X[1] <= 0.677\nentropy = 0.76\nsamples = 50\n
value = [11, 39]'),
 Text(48.16858496953284, 321.8112, 'X[2] <= 0.462\nentropy = 0.696\nsamples = 48\nvalue =
[9, 39]'),
 Text(47.03520649966148, 304.416, 'entropy = 0.0\nsamples = 19\nvalue = [0, 19]'),
 Text(49.3019634394042, 304.416, 'X[2] <= 0.701\nentropy = 0.894\nsamples = 29\nvalue =
[9, 20]'),
 Text(48.16858496953284, 287.0208, 'X[3] <= 0.388\nentropy = 0.954\nsamples = 24\nvalue =
[9, 15]'),
 Text(45.33513879485444, 269.62559999999996, 'X[3] <= 0.317\nentropy = 0.722\nsamples = 5
\nvalue = [4, 1]'),
 Text(44.20176032498308, 252.2304, 'X[2] <= 0.625\nentropy = 1.0\nsamples = 2\nvalue = [1,
1]'),
 Text(43.06838185511172, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(45.33513879485444, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(46.4685172647258, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(51.002031144211244, 269.62559999999996, 'X[1] <= 0.529\nentropy = 0.831\nsamples = 1
9\nvalue = [5, 14]'),
 Text(48.73527420446852, 252.2304, 'X[1] <= 0.438\nentropy = 0.439\nsamples = 11\nvalue =
 [1, 10]'),
 Text(47.601895734597164, 234.83520000000001, 'X[3] <= 0.405\nentropy = 0.918\nsamples = 3
\nvalue = [1, 2]'),
 Text(46.4685172647258, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(48.73527420446852, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(49.868652674339884, 234.83520000000001, 'entropy = 0.0\nsamples = 8\nvalue = [0,
 8]'),
```

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 Text(53.268788083953964, 252.2304, 'X[2] <= 0.617\nentropy = 1.0\nsamples = 8\nvalue =
 [4, 4]'),
 Text(52.135409614082604, 234.83520000000001, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(54.402166553825325, 234.83520000000001, 'X[2] <= 0.661\nentropy = 0.722\nsamples = 5
\nvalue = [1, 4]'),
 Text(53.268788083953964, 217.44, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(55.535545023696685, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(50.435341909275564, 287.0208, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(50.435341909275564, 321.8112, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(51.568720379146924, 339.20640000000003, 'entropy = 0.0\nsamples = 35\nvalue = [0, 3
5]'),
 Text(54.968855788761005, 356.6016, 'X[3] <= 0.812\nentropy = 0.991\nsamples = 9\nvalue =
 [4, 5]'),
 Text(53.835477318889644, 339.20640000000003, 'entropy = 0.0\nsamples = 4\nvalue = [4,
 0]'),
 Text(56.102234258632365, 339.20640000000003, 'entropy = 0.0\nsamples = 5\nvalue = [0,
 5]'),
 Text(123.37444460900474, 391.392, 'X[0] <= 0.374\nentropy = 0.656\nsamples = 1248\nvalue
 = [211, 1037]'),
 Text(76.74211873730535, 373.9968, 'X[1] <= 0.334\nentropy = 0.524\nsamples = 888\nvalue =
 [105, 783]'),
 Text(60.63574813811781, 356.6016, 'X[0] <= 0.33\nentropy = 0.197\nsamples = 196\nvalue =
 [6, 190]'),
 Text(58.368991198375085, 339.20640000000003, 'X[4] <= 0.627\nentropy = 0.062\nsamples = 1
39\nvalue = [1, 138]'),
 Text(57.235612728503725, 321.8112, 'entropy = 0.0\nsamples = 132\nvalue = [0, 132]'),
 Text(59.50236966824645, 321.8112, 'X[4] <= 0.63\nentropy = 0.592\nsamples = 7\nvalue =
 [1, 6]'),
 Text(58.368991198375085, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(60.63574813811781, 304.416, 'entropy = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(62.90250507786053, 339.20640000000003, 'X[0] <= 0.331\nentropy = 0.429\nsamples = 57
\nvalue = [5, 52]'),
 Text(61.76912660798917, 321.8112, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(64.0358835477319, 321.8112, 'X[3] <= 0.473\nentropy = 0.371\nsamples = 56\nvalue =
 [4, 52]'),
 Text(62.90250507786053, 304.416, 'X[3] <= 0.191\nentropy = 0.305\nsamples = 55\nvalue =
 [3, 52]'),
 Text(61.76912660798917, 287.0208, 'X[0] <= 0.351\nentropy = 0.559\nsamples = 23\nvalue =
 [3, 20]'),
 Text(60.63574813811781, 269.62559999999996, 'entropy = 0.0\nsamples = 13\nvalue = [0, 1
3]'),
 Text(62.90250507786053, 269.62559999999996, 'X[3] <= 0.189\nentropy = 0.881\nsamples = 10
\nvalue = [3, 7]'),
 Text(61.76912660798917, 252.2304, 'X[1] <= 0.253\nentropy = 0.764\nsamples = 9\nvalue =
 [2, 7]'),
 Text(60.63574813811781, 234.83520000000001, 'entropy = 0.0\nsamples = 5\nvalue = [0,
 5]'),
 Text(62.90250507786053, 234.83520000000001, 'X[4] <= 0.358\nentropy = 1.0\nsamples = 4\nv
alue = [2, 2]'),
 Text(61.76912660798917, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(64.0358835477319, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(64.0358835477319, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(64.0358835477319, 287.0208, 'entropy = 0.0\nsamples = 32\nvalue = [0, 32]'),
 Text(65.16926201760326, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(92.84848933649289, 356.6016, 'X[3] <= 0.301\nentropy = 0.592\nsamples = 692\nvalue =
 [99, 593]'),
 Text(72.5362220717671, 339.20640000000003, 'X[4] <= 0.567\nentropy = 0.999\nsamples = 69
\nvalue = [36, 33]'),
 Text(69.7027758970887, 321.8112, 'X[1] <= 0.389\nentropy = 0.936\nsamples = 54\nvalue =
 [35, 19]'),
 Text(67.43601895734598, 304.416, 'X[3] <= 0.225\nentropy = 0.831\nsamples = 19\nvalue =
 [5, 14]'),
 Text(66.30264048747462, 287.0208, 'entropy = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(68.56939742721734, 287.0208, 'entropy = 0.0\nsamples = 14\nvalue = [0, 14]'),
 Text(71.96953283683142, 304.416, 'X[1] <= 0.814\nentropy = 0.592\nsamples = 35\nvalue =
```

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 [30, 5]'),
 Text(70.83615436696006, 287.0208, 'X[0] <= 0.306\nentropy = 0.439\nsamples = 33\nvalue =
 [30, 3]'),
 Text(69.7027758970887, 269.62559999999996, 'X[1] <= 0.428\nentropy = 0.75\nsamples = 14\n
value = [11, 3]'),
 Text(67.43601895734598, 252.2304, 'X[1] <= 0.402\nentropy = 0.918\nsamples = 3\nvalue =
 [1, 2]'),
 Text(66.30264048747462, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(68.56939742721734, 234.83520000000001, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(71.96953283683142, 252.2304, 'X[0] <= 0.298\nentropy = 0.439\nsamples = 11\nvalue =
 [10, 1]'),
 Text(70.83615436696006, 234.83520000000001, 'entropy = 0.0\nsamples = 10\nvalue = [10,
 0]'),
 Text(73.10291130670278, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(71.96953283683142, 269.62559999999996, 'entropy = 0.0\nsamples = 19\nvalue = [19,
 0]'),
 Text(73.10291130670278, 287.0208, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(75.3696682464455, 321.8112, 'X[4] <= 0.816\nentropy = 0.353\nsamples = 15\nvalue =
 [1, 14]'),
 Text(74.23628977657414, 304.416, 'entropy = 0.0\nsamples = 14\nvalue = [0, 14]'),
 Text(76.50304671631686, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(113.1607566012187, 339.20640000000003, 'X[1] <= 0.671\nentropy = 0.473\nsamples = 62
3\nvalue = [63, 560]'),
 Text(93.71623222748816, 321.8112, 'X[4] <= 0.421\nentropy = 0.411\nsamples = 546\nvalue =
 [45, 501]'),
 Text(81.31990521327015, 304.416, 'X[3] <= 0.547\nentropy = 0.207\nsamples = 277\nvalue =
 [9, 268]'),
 Text(80.18652674339879, 287.0208, 'X[1] <= 0.484\nentropy = 0.296\nsamples = 172\nvalue =
 [9, 163]'),
 Text(75.3696682464455, 269.62559999999996, 'X[2] <= 0.605\nentropy = 0.064\nsamples = 132
\nvalue = [1, 131]'),
 Text(74.23628977657414, 252.2304, 'entropy = 0.0\nsamples = 92\nvalue = [0, 92]'),
 Text(76.50304671631686, 252.2304, 'X[2] <= 0.611\nentropy = 0.169\nsamples = 40\nvalue =
 [1, 39]'),
 Text(75.3696682464455, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(77.63642518618822, 234.83520000000001, 'entropy = 0.0\nsamples = 39\nvalue = [0, 3
9]'),
 Text(85.00338524035207, 269.62559999999996, 'X[1] <= 0.554\nentropy = 0.722\nsamples = 40
\nvalue = [8, 32]'),
 Text(82.16993906567367, 252.2304, 'X[2] <= 0.625\nentropy = 0.48\nsamples = 29\nvalue =
 [3, 26]'),
 Text(79.90318212593094, 234.83520000000001, 'X[3] <= 0.544\nentropy = 0.235\nsamples = 26
\nvalue = [1, 25]'),
 Text(78.76980365605958, 217.44, 'entropy = 0.0\nsamples = 25\nvalue = [0, 25]'),
 Text(81.0365605958023, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(84.4366960054164, 234.83520000000001, 'X[2] <= 0.775\nentropy = 0.918\nsamples = 3\n
value = [2, 1]'),
 Text(83.30331753554503, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(85.57007447528775, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(87.83683141503047, 252.2304, 'X[0] <= 0.29\nentropy = 0.994\nsamples = 11\nvalue =
 [5, 6]'),
 Text(86.70345294515911, 234.83520000000001, 'entropy = 0.0\nsamples = 5\nvalue = [0,
 5]'),
 Text(88.97020988490183, 234.83520000000001, 'X[0] <= 0.344\nentropy = 0.65\nsamples = 6\n
value = [5, 1]'),
 Text(87.83683141503047, 217.44, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(90.1035883547732, 217.44, 'X[3] <= 0.473\nentropy = 1.0\nsamples = 2\nvalue = [1,
 1]'),
 Text(88.97020988490183, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(91.23696682464455, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(82.4532836831415, 287.0208, 'entropy = 0.0\nsamples = 105\nvalue = [0, 105]'),
 Text(106.11255924170617, 304.416, 'X[0] <= 0.227\nentropy = 0.568\nsamples = 269\nvalue =
 [36, 233]'),
```

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 Text(104.9791807718348, 287.0208, 'entropy = 0.0\nsamples = 48\nvalue = [0, 48]'),
 Text(107.24593771157753, 287.0208, 'X[3] <= 0.384\nentropy = 0.641\nsamples = 221\nvalue
 = [36, 185]'),
 Text(99.17061611374407, 269.62559999999996, 'X[3] <= 0.365\nentropy = 0.957\nsamples = 37
\nvalue = [14, 23]'),
 Text(96.90385917400135, 252.2304, 'X[0] <= 0.344\nentropy = 0.634\nsamples = 25\nvalue =
 [4, 21]'),
 Text(95.77048070413, 234.83520000000001, 'X[0] <= 0.332\nentropy = 0.89\nsamples = 13\nva
lue = [4, 9]'),
 Text(94.63710223425863, 217.44, 'X[4] <= 0.429\nentropy = 0.684\nsamples = 11\nvalue =
 [2, 9]'),
 Text(93.50372376438727, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(95.77048070413, 200.0448, 'X[2] <= 0.398\nentropy = 0.469\nsamples = 10\nvalue = [1,
 9]'),
 Text(94.63710223425863, 182.64960000000002, 'X[3] <= 0.338\nentropy = 1.0\nsamples = 2\nv
alue = [1, 1]'),
 Text(93.50372376438727, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(95.77048070413, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(96.90385917400135, 182.64960000000002, 'entropy = 0.0\nsamples = 8\nvalue = [0,
 8]'),
 Text(96.90385917400135, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(98.03723764387271, 234.83520000000001, 'entropy = 0.0\nsamples = 12\nvalue = [0, 1
2]'),
 Text(101.43737305348681, 252.2304, 'X[2] <= 0.482\nentropy = 0.65\nsamples = 12\nvalue =
 [10, 2]'),
 Text(100.30399458361545, 234.83520000000001, 'X[1] <= 0.592\nentropy = 0.918\nsamples = 3
\nvalue = [1, 2]'),
 Text(99.17061611374407, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(101.43737305348681, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(102.57075152335817, 234.83520000000001, 'entropy = 0.0\nsamples = 9\nvalue = [9,
 0]'),
 Text(115.32125930941098, 269.62559999999996, 'X[3] <= 0.557\nentropy = 0.528\nsamples = 1
84\nvalue = [22, 162]'),
 Text(108.23764387271497, 252.2304, 'X[0] <= 0.353\nentropy = 0.412\nsamples = 133\nvalue
 = [11, 122]'),
 Text(107.10426540284361, 234.83520000000001, 'X[1] <= 0.538\nentropy = 0.493\nsamples = 1
02\nvalue = [11, 91]'),
 Text(103.70412999322953, 217.44, 'X[0] <= 0.228\nentropy = 0.362\nsamples = 87\nvalue =
 [6, 81]'),
 Text(102.57075152335817, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(104.83750846310089, 200.0448, 'X[1] <= 0.334\nentropy = 0.32\nsamples = 86\nvalue =
 [5, 81]'),
 Text(103.70412999322953, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(105.97088693297225, 182.64960000000002, 'X[0] <= 0.353\nentropy = 0.274\nsamples = 8
5\nvalue = [4, 81]'),
 Text(104.83750846310089, 165.25440000000003, 'X[0] <= 0.301\nentropy = 0.222\nsamples = 8
4\nvalue = [3, 81]'),
 Text(103.70412999322953, 147.8592, 'X[0] <= 0.3\nentropy = 0.391\nsamples = 39\nvalue =
 [3, 36]'),
 Text(102.57075152335817, 130.464, 'X[1] <= 0.41\nentropy = 0.297\nsamples = 38\nvalue =
 [2, 36]'),
 Text(101.43737305348681, 113.06880000000001, 'entropy = 0.0\nsamples = 19\nvalue = [0, 1
9]'),
 Text(103.70412999322953, 113.06880000000001, 'X[1] <= 0.413\nentropy = 0.485\nsamples = 1
9\nvalue = [2, 17]'),
 Text(102.57075152335817, 95.67360000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(104.83750846310089, 95.67360000000002, 'X[3] <= 0.439\nentropy = 0.31\nsamples = 18
\nvalue = [1, 17]'),
 Text(103.70412999322953, 78.27840000000003, 'X[1] <= 0.435\nentropy = 0.918\nsamples = 3
\nvalue = [1, 2]'),
 Text(102.57075152335817, 60.88319999999999, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(104.83750846310089, 60.88319999999999, 'entropy = 0.0\nsamples = 1\nvalue = [1,
```

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 0]'),
 Text(105.97088693297225, 78.27840000000003, 'entropy = 0.0\nsamples = 15\nvalue = [0, 1
5]'),
 Text(104.83750846310089, 130.464, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(105.97088693297225, 147.8592, 'entropy = 0.0\nsamples = 45\nvalue = [0, 45]'),
 Text(107.10426540284361, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(110.50440081245769, 217.44, 'X[2] <= 0.296\nentropy = 0.918\nsamples = 15\nvalue =
 [5, 10]'),
 Text(109.37102234258633, 200.0448, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(111.63777928232905, 200.0448, 'X[4] <= 0.57\nentropy = 0.65\nsamples = 12\nvalue =
 [2, 10]'),
 Text(110.50440081245769, 182.64960000000002, 'X[0] <= 0.323\nentropy = 0.918\nsamples = 3
\nvalue = [2, 1]'),
 Text(109.37102234258633, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(111.63777928232905, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(112.77115775220041, 182.64960000000002, 'entropy = 0.0\nsamples = 9\nvalue = [0,
 9]'),
 Text(109.37102234258633, 234.83520000000001, 'entropy = 0.0\nsamples = 31\nvalue = [0, 3
1]'),
 Text(122.40487474610698, 252.2304, 'X[4] <= 0.635\nentropy = 0.752\nsamples = 51\nvalue =
 [11, 40]'),
 Text(121.27149627623562, 234.83520000000001, 'X[4] <= 0.533\nentropy = 0.858\nsamples = 3
9\nvalue = [11, 28]'),
 Text(118.43805010155722, 217.44, 'X[2] <= 0.848\nentropy = 0.491\nsamples = 28\nvalue =
 [3, 25]'),
 Text(116.17129316181449, 200.0448, 'X[4] <= 0.423\nentropy = 0.242\nsamples = 25\nvalue =
 [1, 24]'),
 Text(115.03791469194313, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(117.30467163168585, 182.64960000000002, 'entropy = 0.0\nsamples = 24\nvalue = [0, 2
4]'),
 Text(120.70480704129994, 200.0448, 'X[0] <= 0.351\nentropy = 0.918\nsamples = 3\nvalue =
 [2, 1]'),
 Text(119.57142857142858, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(121.8381855111713, 182.64960000000002, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(124.10494245091402, 217.44, 'X[1] <= 0.502\nentropy = 0.845\nsamples = 11\nvalue =
 [8, 3]'),
 Text(122.97156398104266, 200.0448, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(125.23832092078538, 200.0448, 'X[4] <= 0.567\nentropy = 0.971\nsamples = 5\nvalue =
 [2, 3]'),
 Text(124.10494245091402, 182.64960000000002, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(126.37169939065674, 182.64960000000002, 'X[2] <= 0.319\nentropy = 0.918\nsamples = 3
\nvalue = [2, 1]'),
 Text(125.23832092078538, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(127.5050778605281, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(123.53825321597834, 234.83520000000001, 'entropy = 0.0\nsamples = 12\nvalue = [0, 1
2]'),
 Text(132.60528097494924, 321.8112, 'X[4] <= 0.564\nentropy = 0.785\nsamples = 77\nvalue =
 [18, 59]'),
 Text(128.63845633039946, 304.416, 'X[3] <= 0.667\nentropy = 0.946\nsamples = 44\nvalue =
 [16, 28]'),
 Text(126.37169939065674, 287.0208, 'X[1] <= 0.779\nentropy = 0.932\nsamples = 23\nvalue =
 [15, 8]'),
 Text(125.23832092078538, 269.62559999999996, 'entropy = 0.0\nsamples = 10\nvalue = [10,
 0]'),
 Text(127.5050778605281, 269.62559999999996, 'X[4] <= 0.412\nentropy = 0.961\nsamples = 13
\nvalue = [5, 8]'),
 Text(126.37169939065674, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
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 Text(128.63845633039946, 252.2304, 'X[0] <= 0.321\nentropy = 0.722\nsamples = 10\nvalue =
 [2, 8]'),
 Text(127.5050778605281, 234.83520000000001, 'X[1] <= 0.966\nentropy = 0.918\nsamples = 3
\nvalue = [2, 1]'),
 Text(126.37169939065674, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(128.63845633039946, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(129.77183480027082, 234.83520000000001, 'entropy = 0.0\nsamples = 7\nvalue = [0,
 7]'),
 Text(130.90521327014218, 287.0208, 'X[2] <= 0.122\nentropy = 0.276\nsamples = 21\nvalue =
 [1, 20]'),
 Text(129.77183480027082, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(132.03859174001354, 269.62559999999996, 'entropy = 0.0\nsamples = 20\nvalue = [0, 2
0]'),
 Text(136.57210561949898, 304.416, 'X[0] <= 0.253\nentropy = 0.33\nsamples = 33\nvalue =
 [2, 31]'),
 Text(135.43872714962762, 287.0208, 'X[3] <= 0.493\nentropy = 0.971\nsamples = 5\nvalue =
 [2, 3]'),
 Text(134.30534867975626, 269.62559999999996, 'entropy = 0.0\nsamples = 3\nvalue = [0,
 3]'),
 Text(136.57210561949898, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(137.70548408937034, 287.0208, 'entropy = 0.0\nsamples = 28\nvalue = [0, 28]'),
 Text(170.00677048070415, 373.9968, 'X[4] <= 0.621\nentropy = 0.874\nsamples = 360\nvalue
 = [106, 254]'),
 Text(151.3060257278267, 356.6016, 'X[1] <= 0.286\nentropy = 0.931\nsamples = 291\nvalue =
 [101, 190]'),
 Text(142.23899796885578, 339.20640000000003, 'X[3] <= 0.327\nentropy = 0.527\nsamples = 4
2\nvalue = [5, 37]'),
 Text(139.97224102911306, 321.8112, 'X[0] <= 0.417\nentropy = 0.191\nsamples = 34\nvalue =
 [1, 33]'),
 Text(138.8388625592417, 304.416, 'entropy = 0.0\nsamples = 33\nvalue = [0, 33]'),
 Text(141.10561949898442, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(144.5057549085985, 321.8112, 'X[4] <= 0.445\nentropy = 1.0\nsamples = 8\nvalue = [4,
 4]'),
 Text(143.37237643872714, 304.416, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(145.6391333784699, 304.416, 'X[3] <= 0.696\nentropy = 0.722\nsamples = 5\nvalue =
 [1, 4]'),
 Text(144.5057549085985, 287.0208, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(146.77251184834125, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(160.37305348679757, 339.20640000000003, 'X[3] <= 0.236\nentropy = 0.962\nsamples = 2
49\nvalue = [96, 153]'),
 Text(151.3060257278267, 321.8112, 'X[1] <= 0.676\nentropy = 0.779\nsamples = 26\nvalue =
 [20, 6]'),
 Text(150.17264725795533, 304.416, 'X[2] <= 0.424\nentropy = 0.276\nsamples = 21\nvalue =
 [20, 1]'),
 Text(149.03926878808397, 287.0208, 'X[2] <= 0.393\nentropy = 0.918\nsamples = 3\nvalue =
 [2, 1]'),
 Text(147.9058903182126, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(150.17264725795533, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(151.3060257278267, 287.0208, 'entropy = 0.0\nsamples = 18\nvalue = [18, 0]'),
 Text(152.43940419769805, 304.416, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(169.44008124576845, 321.8112, 'X[4] <= 0.46\nentropy = 0.926\nsamples = 223\nvalue =
 [76, 147]'),
 Text(162.0731211916046, 304.416, 'X[1] <= 0.601\nentropy = 0.808\nsamples = 137\nvalue =
 [34, 103]'),
 Text(155.83953960731213, 287.0208, 'X[3] <= 0.369\nentropy = 0.628\nsamples = 108\nvalue
 = [17, 91]'),
 Text(152.43940419769805, 269.62559999999996, 'X[1] <= 0.454\nentropy = 0.896\nsamples = 3
2\nvalue = [10, 22]'),
 Text(151.3060257278267, 252.2304, 'X[4] <= 0.365\nentropy = 0.691\nsamples = 27\nvalue =
 [5, 22]'),
 Text(149.03926878808397, 234.83520000000001, 'X[3] <= 0.322\nentropy = 0.971\nsamples = 5
\nvalue = [3, 2]'),
```

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 Text(147.9058903182126, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(150.17264725795533, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(153.5727826675694, 234.83520000000001, 'X[0] <= 0.406\nentropy = 0.439\nsamples = 22
\nvalue = [2, 20]'),
 Text(152.43940419769805, 217.44, 'X[0] <= 0.402\nentropy = 0.684\nsamples = 11\nvalue =
 [2, 9]'),
 Text(151.3060257278267, 200.0448, 'X[3] <= 0.299\nentropy = 0.469\nsamples = 10\nvalue =
 [1, 9]'),
 Text(150.17264725795533, 182.64960000000002, 'X[3] <= 0.285\nentropy = 0.918\nsamples = 3
\nvalue = [1, 2]'),
 Text(149.03926878808397, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(151.3060257278267, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(152.43940419769805, 182.64960000000002, 'entropy = 0.0\nsamples = 7\nvalue = [0,
 7]'),
 Text(153.5727826675694, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(154.70616113744077, 217.44, 'entropy = 0.0\nsamples = 11\nvalue = [0, 11]'),
 Text(153.5727826675694, 252.2304, 'entropy = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(159.2396750169262, 269.62559999999996, 'X[0] <= 0.388\nentropy = 0.443\nsamples = 76
\nvalue = [7, 69]'),
 Text(156.9729180771835, 252.2304, 'X[0] <= 0.382\nentropy = 0.742\nsamples = 19\nvalue =
 [4, 15]'),
 Text(155.83953960731213, 234.83520000000001, 'entropy = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
 Text(158.10629654705485, 234.83520000000001, 'X[2] <= 0.479\nentropy = 1.0\nsamples = 8\n
value = [4, 4]'),
 Text(156.9729180771835, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(159.2396750169262, 217.44, 'X[3] <= 0.39\nentropy = 0.722\nsamples = 5\nvalue = [4,
 1]'),
 Text(158.10629654705485, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(160.37305348679757, 200.0448, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(161.50643195666893, 252.2304, 'X[0] <= 0.408\nentropy = 0.297\nsamples = 57\nvalue =
 [3, 54]'),
 Text(160.37305348679757, 234.83520000000001, 'entropy = 0.0\nsamples = 30\nvalue = [0, 3
0]'),
 Text(162.6398104265403, 234.83520000000001, 'X[3] <= 0.483\nentropy = 0.503\nsamples = 27
\nvalue = [3, 24]'),
 Text(161.50643195666893, 217.44, 'entropy = 0.0\nsamples = 14\nvalue = [0, 14]'),
 Text(163.77318889641165, 217.44, 'X[3] <= 0.485\nentropy = 0.779\nsamples = 13\nvalue =
 [3, 10]'),
 Text(162.6398104265403, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(164.906567366283, 200.0448, 'X[2] <= 0.826\nentropy = 0.439\nsamples = 11\nvalue =
 [1, 10]'),
 Text(163.77318889641165, 182.64960000000002, 'entropy = 0.0\nsamples = 10\nvalue = [0, 1
0]'),
 Text(166.03994583615437, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(168.3067027758971, 287.0208, 'X[3] <= 0.648\nentropy = 0.978\nsamples = 29\nvalue =
 [17, 12]'),
 Text(167.17332430602573, 269.62559999999996, 'X[4] <= 0.368\nentropy = 0.485\nsamples = 1
9\nvalue = [17, 2]'),
 Text(166.03994583615437, 252.2304, 'X[4] <= 0.35\nentropy = 0.918\nsamples = 6\nvalue =
 [4, 2]'),
 Text(164.906567366283, 234.83520000000001, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(167.17332430602573, 234.83520000000001, 'X[2] <= 0.436\nentropy = 0.918\nsamples = 3
\nvalue = [1, 2]'),
 Text(166.03994583615437, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(168.3067027758971, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(168.3067027758971, 252.2304, 'entropy = 0.0\nsamples = 13\nvalue = [13, 0]'),
 Text(169.44008124576845, 269.62559999999996, 'entropy = 0.0\nsamples = 10\nvalue = [0, 1
0]'),
 Text(176.8070412999323, 304.416, 'X[1] <= 0.7\nentropy = 1.0\nsamples = 86\nvalue = [42,
 44]'),
 Text(172.84021665538253, 287.0208, 'X[2] <= 0.318\nentropy = 0.983\nsamples = 59\nvalue =
 [34, 25]'),
```

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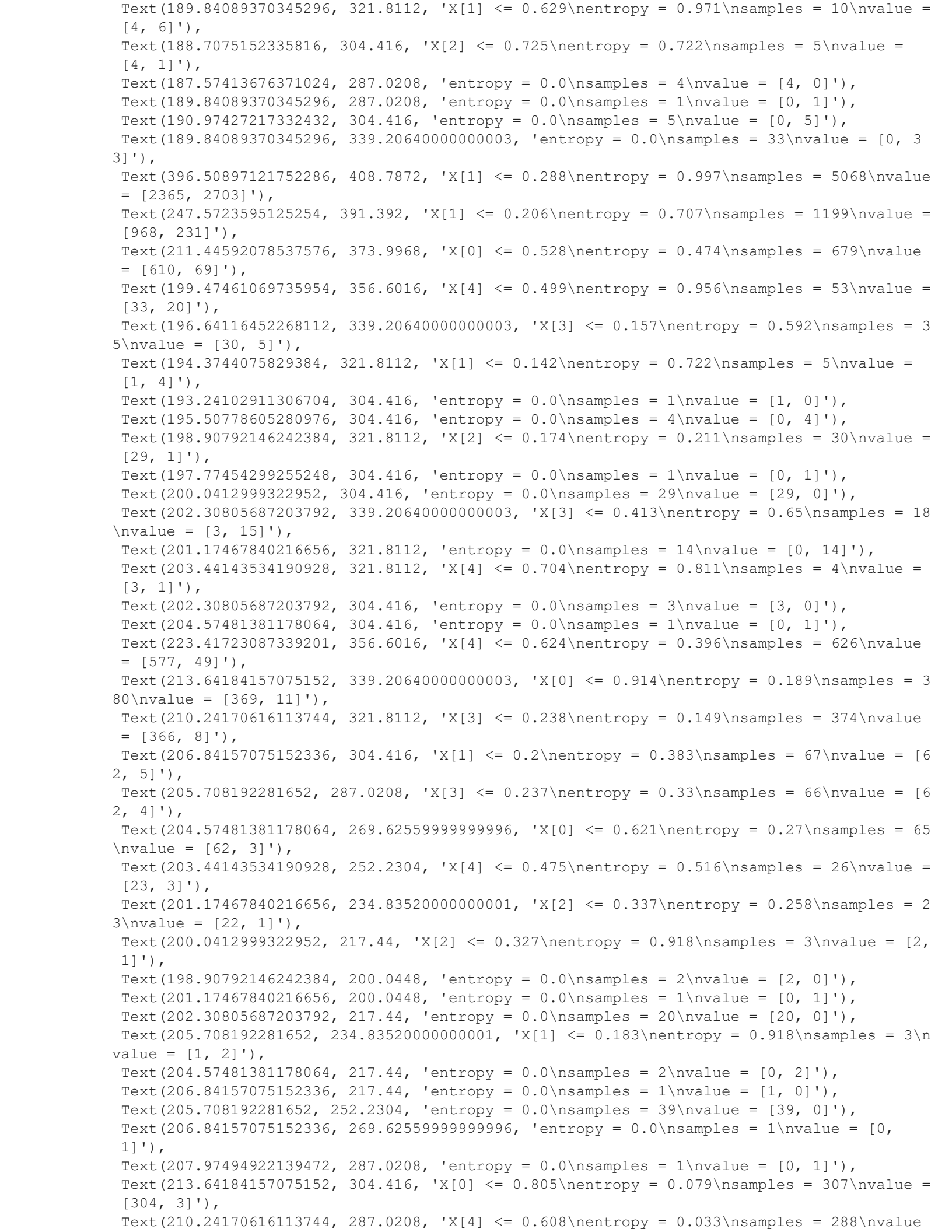
 Text(171.70683818551117, 269.62559999999996, 'entropy = 0.0\nsamples = 6\nvalue = [6,
 0]'),
 Text(173.9735951252539, 269.62559999999996, 'X[2] <= 0.353\nentropy = 0.998\nsamples = 53
\nvalue = [28, 25]'),
 Text(172.84021665538253, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(175.10697359512525, 252.2304, 'X[2] <= 0.802\nentropy = 0.99\nsamples = 50\nvalue =
 [28, 22]'),
 Text(173.9735951252539, 234.83520000000001, 'X[3] <= 0.47\nentropy = 0.997\nsamples = 47
\nvalue = [25, 22]'),
 Text(171.1401489505755, 217.44, 'X[1] <= 0.423\nentropy = 0.931\nsamples = 26\nvalue = [1
7, 9]'),
 Text(170.00677048070415, 200.0448, 'X[4] <= 0.515\nentropy = 0.811\nsamples = 12\nvalue =
 [3, 9]'),
 Text(168.8733920108328, 182.64960000000002, 'X[4] <= 0.498\nentropy = 1.0\nsamples = 6\nv
alue = [3, 3]'),
 Text(167.74001354096143, 165.25440000000003, 'entropy = 0.0\nsamples = 3\nvalue = [0,
 3]'),
 Text(170.00677048070415, 165.25440000000003, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(171.1401489505755, 182.64960000000002, 'entropy = 0.0\nsamples = 6\nvalue = [0,
 6]'),
 Text(172.27352742044687, 200.0448, 'entropy = 0.0\nsamples = 14\nvalue = [14, 0]'),
 Text(176.8070412999323, 217.44, 'X[1] <= 0.431\nentropy = 0.959\nsamples = 21\nvalue =
 [8, 13]'),
 Text(174.5402843601896, 200.0448, 'X[0] <= 0.418\nentropy = 0.544\nsamples = 8\nvalue =
 [7, 1]'),
 Text(173.40690589031823, 182.64960000000002, 'entropy = 0.0\nsamples = 7\nvalue = [7,
 0]'),
 Text(175.67366283006095, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(179.07379823967503, 200.0448, 'X[0] <= 0.374\nentropy = 0.391\nsamples = 13\nvalue =
 [1, 12]'),
 Text(177.94041976980367, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(180.2071767095464, 182.64960000000002, 'entropy = 0.0\nsamples = 12\nvalue = [0, 1
2]'),
 Text(176.2403520649966, 234.83520000000001, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(180.77386594448205, 287.0208, 'X[0] <= 0.388\nentropy = 0.877\nsamples = 27\nvalue =
 [8, 19]'),
 Text(178.50710900473933, 269.62559999999996, 'X[4] <= 0.583\nentropy = 0.65\nsamples = 6
\nvalue = [5, 1]'),
 Text(177.37373053486797, 252.2304, 'entropy = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(179.6404874746107, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(183.0406228842248, 269.62559999999996, 'X[4] <= 0.469\nentropy = 0.592\nsamples = 21
\nvalue = [3, 18]'),
 Text(181.90724441435344, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(184.17400135409616, 252.2304, 'X[2] <= 0.499\nentropy = 0.297\nsamples = 19\nvalue =
 [1, 18]'),
 Text(183.0406228842248, 234.83520000000001, 'entropy = 0.0\nsamples = 13\nvalue = [0, 1
3]'),
 Text(185.30737982396752, 234.83520000000001, 'X[2] <= 0.533\nentropy = 0.65\nsamples = 6
\nvalue = [1, 5]'),
 Text(184.17400135409616, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(186.44075829383888, 217.44, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(188.7075152335816, 356.6016, 'X[4] <= 0.694\nentropy = 0.375\nsamples = 69\nvalue =
 [5, 64]'),
 Text(187.57413676371024, 339.20640000000003, 'X[0] <= 0.407\nentropy = 0.581\nsamples = 3
6\nvalue = [5, 31]'),
 Text(185.30737982396752, 321.8112, 'X[3] <= 0.239\nentropy = 0.235\nsamples = 26\nvalue =
 [1, 25]'),
 Text(184.17400135409616, 304.416, 'X[0] <= 0.393\nentropy = 1.0\nsamples = 2\nvalue = [1,
 1]'),
 Text(183.0406228842248, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(185.30737982396752, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(186.44075829383888, 304.416, 'entropy = 0.0\nsamples = 24\nvalue = [0, 24]'),
```


Text(189.84089370345296, 321.8112, 'X[1] <= 0.629\nentropy = 0.971\nsamples = 10\nvalue = [4, 6]'),
Text(188.7075152335816, 304.416, 'X[2] <= 0.725\nentropy = 0.722\nsamples = 5\nvalue = [4, 1]'),
Text(187.57413676371024, 287.0208, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
Text(189.84089370345296, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(190.97427217332432, 304.416, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
Text(189.84089370345296, 339.20640000000003, 'entropy = 0.0\nsamples = 33\nvalue = [0, 33]'),
Text(396.50897121752286, 408.7872, 'X[1] <= 0.288\nentropy = 0.997\nsamples = 5068\nvalue = [2365, 2703]'),
Text(247.5723595125254, 391.392, 'X[1] <= 0.206\nentropy = 0.707\nsamples = 1199\nvalue = [968, 231]'),
Text(211.44592078537576, 373.9968, 'X[0] <= 0.528\nentropy = 0.474\nsamples = 679\nvalue = [610, 69]'),
Text(199.47461069735954, 356.6016, 'X[4] <= 0.499\nentropy = 0.956\nsamples = 53\nvalue = [33, 20]'),
Text(196.64116452268112, 339.20640000000003, 'X[3] <= 0.157\nentropy = 0.592\nsamples = 35\nvalue = [30, 5]'),
Text(194.3744075829384, 321.8112, 'X[1] <= 0.142\nentropy = 0.722\nsamples = 5\nvalue = [1, 4]'),
Text(193.24102911306704, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(195.50778605280976, 304.416, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
Text(198.90792146242384, 321.8112, 'X[2] <= 0.174\nentropy = 0.211\nsamples = 30\nvalue = [29, 1]'),
Text(197.77454299255248, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(200.0412999322952, 304.416, 'entropy = 0.0\nsamples = 29\nvalue = [29, 0]'),
Text(202.30805687203792, 339.20640000000003, 'X[3] <= 0.413\nentropy = 0.65\nsamples = 18\nvalue = [3, 15]'),
Text(201.17467840216656, 321.8112, 'entropy = 0.0\nsamples = 14\nvalue = [0, 14]'),
Text(203.44143534190928, 321.8112, 'X[4] <= 0.704\nentropy = 0.811\nsamples = 4\nvalue = [3, 1]'),
Text(202.30805687203792, 304.416, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(204.57481381178064, 304.416, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(223.41723087339201, 356.6016, 'X[4] <= 0.624\nentropy = 0.396\nsamples = 626\nvalue = [577, 49]'),
Text(213.64184157075152, 339.20640000000003, 'X[0] <= 0.914\nentropy = 0.189\nsamples = 380\nvalue = [369, 11]'),
Text(210.24170616113744, 321.8112, 'X[3] <= 0.238\nentropy = 0.149\nsamples = 374\nvalue = [366, 8]'),
Text(206.84157075152336, 304.416, 'X[1] <= 0.2\nentropy = 0.383\nsamples = 67\nvalue = [62, 5]'),
Text(205.708192281652, 287.0208, 'X[3] <= 0.237\nentropy = 0.33\nsamples = 66\nvalue = [62, 4]'),
Text(204.57481381178064, 269.62559999999996, 'X[0] <= 0.621\nentropy = 0.27\nsamples = 65\nvalue = [62, 3]'),
Text(203.44143534190928, 252.2304, 'X[4] <= 0.475\nentropy = 0.516\nsamples = 26\nvalue = [23, 3]'),
Text(201.17467840216656, 234.83520000000001, 'X[2] <= 0.337\nentropy = 0.258\nsamples = 23\nvalue = [22, 1]'),
Text(200.0412999322952, 217.44, 'X[2] <= 0.327\nentropy = 0.918\nsamples = 3\nvalue = [2, 1]'),
Text(198.90792146242384, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(201.17467840216656, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(202.30805687203792, 217.44, 'entropy = 0.0\nsamples = 20\nvalue = [20, 0]'),
Text(205.708192281652, 234.83520000000001, 'X[1] <= 0.183\nentropy = 0.918\nsamples = 3\nvalue = [1, 2]'),
Text(204.57481381178064, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(206.84157075152336, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(205.708192281652, 252.2304, 'entropy = 0.0\nsamples = 39\nvalue = [39, 0]'),
Text(206.84157075152336, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(207.97494922139472, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(213.64184157075152, 304.416, 'X[0] <= 0.805\nentropy = 0.079\nsamples = 307\nvalue = [304, 3]'),
Text(210.24170616113744, 287.0208, 'X[4] <= 0.608\nentropy = 0.033\nsamples = 288\nvalue

= [287, 1]'),
 Text(209.10832769126608, 269.62559999999996, 'entropy = 0.0\nsamples = 253\nvalue = [253,
 0]'),
 Text(211.3750846310088, 269.62559999999996, 'X[4] <= 0.609\nentropy = 0.187\nsamples = 35
\nvalue = [34, 1]'),
 Text(210.24170616113744, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(212.50846310088016, 252.2304, 'entropy = 0.0\nsamples = 34\nvalue = [34, 0]'),
 Text(217.0419769803656, 287.0208, 'X[0] <= 0.815\nentropy = 0.485\nsamples = 19\nvalue =
 [17, 2]'),
 Text(215.90859851049424, 269.62559999999996, 'X[3] <= 0.448\nentropy = 1.0\nsamples = 4\n
value = [2, 2]'),
 Text(214.77522004062288, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(217.0419769803656, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(218.175355450237, 269.62559999999996, 'entropy = 0.0\nsamples = 15\nvalue = [15,
 0]'),
 Text(217.0419769803656, 321.8112, 'X[3] <= 0.568\nentropy = 1.0\nsamples = 6\nvalue = [3,
 3]'),
 Text(215.90859851049424, 304.416, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(218.175355450237, 304.416, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(233.1926201760325, 339.20640000000003, 'X[1] <= 0.147\nentropy = 0.621\nsamples = 24
6\nvalue = [208, 38]'),
 Text(223.8422477995938, 321.8112, 'X[0] <= 0.837\nentropy = 0.36\nsamples = 146\nvalue =
 [136, 10]'),
 Text(220.4421123899797, 304.416, 'X[4] <= 0.689\nentropy = 0.174\nsamples = 115\nvalue =
 [112, 3]'),
 Text(219.30873392010835, 287.0208, 'entropy = 0.0\nsamples = 77\nvalue = [77, 0]'),
 Text(221.57549085985107, 287.0208, 'X[3] <= 0.708\nentropy = 0.398\nsamples = 38\nvalue =
 [35, 3]'),
 Text(220.4421123899797, 269.62559999999996, 'X[1] <= 0.114\nentropy = 0.971\nsamples = 5
\nvalue = [2, 3]'),
 Text(219.30873392010835, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(221.57549085985107, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(222.70886932972243, 269.62559999999996, 'entropy = 0.0\nsamples = 33\nvalue = [33,
 0]'),
 Text(227.24238320920787, 304.416, 'X[4] <= 0.721\nentropy = 0.771\nsamples = 31\nvalue =
 [24, 7]'),
 Text(226.1090047393365, 287.0208, 'X[3] <= 0.659\nentropy = 0.949\nsamples = 19\nvalue =
 [12, 7]'),
 Text(224.97562626946515, 269.62559999999996, 'entropy = 0.0\nsamples = 7\nvalue = [7,
 0]'),
 Text(227.24238320920787, 269.62559999999996, 'X[3] <= 0.705\nentropy = 0.98\nsamples = 12
\nvalue = [5, 7]'),
 Text(226.1090047393365, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(228.37576167907923, 252.2304, 'X[3] <= 0.774\nentropy = 0.991\nsamples = 9\nvalue =
 [5, 4]'),
 Text(227.24238320920787, 234.83520000000001, 'entropy = 0.0\nsamples = 4\nvalue = [4,
 0]'),
 Text(229.5091401489506, 234.83520000000001, 'X[1] <= 0.068\nentropy = 0.722\nsamples = 5
\nvalue = [1, 4]'),
 Text(228.37576167907923, 217.44, 'X[3] <= 0.805\nentropy = 1.0\nsamples = 2\nvalue = [1,
 1]'),
 Text(227.24238320920787, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(229.5091401489506, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(230.64251861882195, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(228.37576167907923, 287.0208, 'entropy = 0.0\nsamples = 12\nvalue = [12, 0]'),
 Text(242.54299255247125, 321.8112, 'X[0] <= 0.79\nentropy = 0.855\nsamples = 100\nvalue =
 [72, 28]'),
 Text(239.70954637779283, 304.416, 'X[4] <= 0.834\nentropy = 0.754\nsamples = 83\nvalue =
 [65, 18]'),
 Text(238.57616790792147, 287.0208, 'X[3] <= 0.875\nentropy = 0.696\nsamples = 80\nvalue =
 [65, 15]'),
 Text(237.4427894380501, 269.62559999999996, 'X[4] <= 0.671\nentropy = 0.755\nsamples = 69
\nvalue = [54, 15]'),
 Text(232.90927555856467, 252.2304, 'X[0] <= 0.695\nentropy = 0.439\nsamples = 33\nvalue =
 [30, 3]'),
 Text(231.7758970886933, 234.83520000000001, 'entropy = 0.0\nsamples = 19\nvalue = [19,

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 0]'),
 Text(234.04265402843603, 234.83520000000001, 'X[3] <= 0.629\nentropy = 0.75\nsamples = 14
\nvalue = [11, 3]'),
 Text(232.90927555856467, 217.44, 'entropy = 0.0\nsamples = 11\nvalue = [11, 0]'),
 Text(235.1760324983074, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(241.97630331753555, 252.2304, 'X[3] <= 0.595\nentropy = 0.918\nsamples = 36\nvalue =
 [24, 12]'),
 Text(238.57616790792147, 234.83520000000001, 'X[4] <= 0.791\nentropy = 0.592\nsamples = 7
\nvalue = [1, 6]'),
 Text(237.4427894380501, 217.44, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(239.70954637779283, 217.44, 'X[4] <= 0.799\nentropy = 1.0\nsamples = 2\nvalue = [1,
 1]'),
 Text(238.57616790792147, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(240.8429248476642, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(245.37643872714963, 234.83520000000001, 'X[0] <= 0.739\nentropy = 0.736\nsamples = 2
9\nvalue = [23, 6]'),
 Text(244.24306025727827, 217.44, 'X[4] <= 0.765\nentropy = 0.937\nsamples = 17\nvalue =
 [11, 6]'),
 Text(243.1096817874069, 200.0448, 'X[0] <= 0.66\nentropy = 0.837\nsamples = 15\nvalue =
 [11, 4]'),
 Text(241.97630331753555, 182.64960000000002, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(244.24306025727827, 182.64960000000002, 'X[2] <= 0.663\nentropy = 0.619\nsamples = 1
3\nvalue = [11, 2]'),
 Text(243.1096817874069, 165.25440000000003, 'entropy = 0.0\nsamples = 9\nvalue = [9,
 0]'),
 Text(245.37643872714963, 165.25440000000003, 'X[4] <= 0.691\nentropy = 1.0\nsamples = 4\n
value = [2, 2]'),
 Text(244.24306025727827, 147.8592, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(246.509817197021, 147.8592, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(245.37643872714963, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(246.509817197021, 217.44, 'entropy = 0.0\nsamples = 12\nvalue = [12, 0]'),
 Text(239.70954637779283, 269.62559999999996, 'entropy = 0.0\nsamples = 11\nvalue = [11,
 0]'),
 Text(240.8429248476642, 287.0208, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(245.37643872714963, 304.416, 'X[4] <= 0.652\nentropy = 0.977\nsamples = 17\nvalue =
 [7, 10]'),
 Text(244.24306025727827, 287.0208, 'entropy = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(246.509817197021, 287.0208, 'X[1] <= 0.179\nentropy = 0.946\nsamples = 11\nvalue =
 [7, 4]'),
 Text(245.37643872714963, 269.62559999999996, 'X[1] <= 0.165\nentropy = 0.918\nsamples = 6
\nvalue = [2, 4]'),
 Text(244.24306025727827, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(246.509817197021, 252.2304, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(247.64319566689235, 269.62559999999996, 'entropy = 0.0\nsamples = 5\nvalue = [5,
 0]'),
 Text(283.69879823967506, 373.9968, 'X[4] <= 0.644\nentropy = 0.895\nsamples = 520\nvalue
 = [358, 162]'),
 Text(269.88574813811783, 356.6016, 'X[0] <= 0.508\nentropy = 0.787\nsamples = 374\nvalue
 = [286, 88]'),
 Text(258.976980365606, 339.20640000000003, 'X[3] <= 0.324\nentropy = 0.99\nsamples = 93\n
value = [52, 41]'),
 Text(255.0101557210562, 321.8112, 'X[4] <= 0.484\nentropy = 0.936\nsamples = 54\nvalue =
 [19, 35]'),
 Text(253.87677725118485, 304.416, 'X[4] <= 0.39\nentropy = 0.987\nsamples = 44\nvalue =
 [19, 25]'),
 Text(251.04333107650643, 287.0208, 'X[1] <= 0.284\nentropy = 0.672\nsamples = 17\nvalue =
 [3, 14]'),
 Text(249.90995260663507, 269.62559999999996, 'X[4] <= 0.293\nentropy = 0.353\nsamples = 1
5\nvalue = [1, 14]'),
 Text(248.7765741367637, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(251.04333107650643, 252.2304, 'entropy = 0.0\nsamples = 14\nvalue = [0, 14]'),
 Text(252.1767095463778, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(256.71022342586326, 287.0208, 'X[1] <= 0.278\nentropy = 0.975\nsamples = 27\nvalue =
 [16, 11]'),
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 Text(255.5768449559919, 269.62559999999996, 'X[4] <= 0.408\nentropy = 0.999\nsamples = 23
\nvalue = [12, 11]'),
 Text(253.31008801624915, 252.2304, 'X[4] <= 0.397\nentropy = 0.592\nsamples = 7\nvalue =
 [6, 1]'),
 Text(252.1767095463778, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(254.44346648612054, 234.83520000000001, 'entropy = 0.0\nsamples = 6\nvalue = [6,
 0]'),
 Text(257.8436018957346, 252.2304, 'X[3] <= 0.149\nentropy = 0.954\nsamples = 16\nvalue =
 [6, 10]'),
 Text(256.71022342586326, 234.83520000000001, 'entropy = 0.0\nsamples = 4\nvalue = [0,
 4]'),
 Text(258.976980365606, 234.83520000000001, 'X[4] <= 0.436\nentropy = 1.0\nsamples = 12\nv
alue = [6, 6]'),
 Text(256.71022342586326, 217.44, 'X[3] <= 0.175\nentropy = 0.722\nsamples = 5\nvalue =
 [1, 4]'),
 Text(255.5768449559919, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(257.8436018957346, 200.0448, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(261.2437373053487, 217.44, 'X[3] <= 0.273\nentropy = 0.863\nsamples = 7\nvalue = [5,
 2]'),
 Text(260.1103588354773, 200.0448, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(262.37711577522003, 200.0448, 'X[4] <= 0.474\nentropy = 0.918\nsamples = 3\nvalue =
 [1, 2]'),
 Text(261.2437373053487, 182.64960000000002, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(263.5104942450914, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(257.8436018957346, 269.62559999999996, 'entropy = 0.0\nsamples = 4\nvalue = [4,
 0]'),
 Text(256.1435341909276, 304.416, 'entropy = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(262.94380501015576, 321.8112, 'X[0] <= 0.436\nentropy = 0.619\nsamples = 39\nvalue =
 [33, 6]'),
 Text(260.1103588354773, 304.416, 'X[1] <= 0.277\nentropy = 0.811\nsamples = 4\nvalue =
 [1, 3]'),
 Text(258.976980365606, 287.0208, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(261.2437373053487, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(265.77725118483414, 304.416, 'X[2] <= 0.701\nentropy = 0.422\nsamples = 35\nvalue =
 [32, 3]'),
 Text(263.5104942450914, 287.0208, 'X[4] <= 0.383\nentropy = 0.206\nsamples = 31\nvalue =
 [30, 1]'),
 Text(262.37711577522003, 269.62559999999996, 'X[3] <= 0.348\nentropy = 1.0\nsamples = 2\n
value = [1, 1]'),
 Text(261.2437373053487, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(263.5104942450914, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(264.64387271496275, 269.62559999999996, 'entropy = 0.0\nsamples = 29\nvalue = [29,
 0]'),
 Text(268.04400812457686, 287.0208, 'X[4] <= 0.526\nentropy = 1.0\nsamples = 4\nvalue =
 [2, 2]'),
 Text(266.9106296547055, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(269.1773865944482, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(280.7945159106297, 339.20640000000003, 'X[0] <= 0.698\nentropy = 0.651\nsamples = 28
1\nvalue = [234, 47]'),
 Text(275.4109681787407, 321.8112, 'X[4] <= 0.521\nentropy = 0.353\nsamples = 210\nvalue =
 [196, 14]'),
 Text(271.4441435341909, 304.416, 'X[4] <= 0.283\nentropy = 0.564\nsamples = 83\nvalue =
 [72, 11]'),
 Text(270.3107650643196, 287.0208, 'entropy = 0.0\nsamples = 20\nvalue = [20, 0]'),
 Text(272.5775220040623, 287.0208, 'X[1] <= 0.224\nentropy = 0.668\nsamples = 63\nvalue =
 [52, 11]'),
 Text(271.4441435341909, 269.62559999999996, 'entropy = 0.0\nsamples = 10\nvalue = [10,
 0]'),
 Text(273.7109004739337, 269.62559999999996, 'X[0] <= 0.535\nentropy = 0.737\nsamples = 53
\nvalue = [42, 11]'),
 Text(271.4441435341909, 252.2304, 'X[1] <= 0.245\nentropy = 0.31\nsamples = 18\nvalue =
```

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 [17, 1]'),
 Text(270.3107650643196, 234.83520000000001, 'X[4] <= 0.435\nentropy = 1.0\nsamples = 2\nvalue = [1, 1]'),
 Text(269.1773865944482, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(271.4441435341909, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(272.5775220040623, 234.83520000000001, 'entropy = 0.0\nsamples = 16\nvalue = [16, 0]'),
 Text(275.9776574136764, 252.2304, 'X[0] <= 0.666\nentropy = 0.863\nsamples = 35\nvalue = [25, 10]'),
 Text(274.844278943805, 234.83520000000001, 'X[0] <= 0.638\nentropy = 0.907\nsamples = 31\nvalue = [21, 10]'),
 Text(273.7109004739337, 217.44, 'X[4] <= 0.354\nentropy = 0.85\nsamples = 29\nvalue = [21, 8]'),
 Text(272.5775220040623, 200.0448, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(274.844278943805, 200.0448, 'X[3] <= 0.123\nentropy = 0.932\nsamples = 23\nvalue = [15, 8]'),
 Text(273.7109004739337, 182.64960000000002, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(275.9776574136764, 182.64960000000002, 'X[0] <= 0.547\nentropy = 0.982\nsamples = 19\nvalue = [11, 8]'),
 Text(274.844278943805, 165.25440000000003, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(277.11103588354774, 165.25440000000003, 'X[0] <= 0.572\nentropy = 0.896\nsamples = 16\nvalue = [11, 5]'),
 Text(274.844278943805, 147.8592, 'X[4] <= 0.519\nentropy = 0.544\nsamples = 8\nvalue = [7, 1]'),
 Text(273.7109004739337, 130.464, 'entropy = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(275.9776574136764, 130.464, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(279.37779282329046, 147.8592, 'X[4] <= 0.456\nentropy = 1.0\nsamples = 8\nvalue = [4, 4]'),
 Text(278.24441435341913, 130.464, 'X[0] <= 0.582\nentropy = 0.722\nsamples = 5\nvalue = [4, 1]'),
 Text(277.11103588354774, 113.06880000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(279.37779282329046, 113.06880000000001, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(280.51117129316185, 130.464, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(275.9776574136764, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(277.11103588354774, 234.83520000000001, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(279.37779282329046, 304.416, 'X[1] <= 0.263\nentropy = 0.161\nsamples = 127\nvalue = [124, 3]'),
 Text(278.24441435341913, 287.0208, 'entropy = 0.0\nsamples = 88\nvalue = [88, 0]'),
 Text(280.51117129316185, 287.0208, 'X[0] <= 0.663\nentropy = 0.391\nsamples = 39\nvalue = [36, 3]'),
 Text(279.37779282329046, 269.62559999999996, 'X[1] <= 0.264\nentropy = 0.179\nsamples = 37\nvalue = [36, 1]'),
 Text(278.24441435341913, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(280.51117129316185, 252.2304, 'entropy = 0.0\nsamples = 36\nvalue = [36, 0]'),
 Text(281.6445497630332, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(286.1780636425186, 321.8112, 'X[4] <= 0.517\nentropy = 0.996\nsamples = 71\nvalue = [38, 33]'),
 Text(283.9113067027759, 304.416, 'X[0] <= 0.828\nentropy = 0.477\nsamples = 39\nvalue = [35, 4]'),
 Text(282.77792823290457, 287.0208, 'entropy = 0.0\nsamples = 24\nvalue = [24, 0]'),
 Text(285.0446851726473, 287.0208, 'X[0] <= 0.834\nentropy = 0.837\nsamples = 15\nvalue = [11, 4]'),
 Text(283.9113067027759, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(286.1780636425186, 269.62559999999996, 'X[2] <= 0.662\nentropy = 0.75\nsamples = 14\nvalue = [11, 3]'),
 Text(285.0446851726473, 252.2304, 'entropy = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(287.31144211239, 252.2304, 'X[4] <= 0.395\nentropy = 1.0\nsamples = 6\nvalue = [3, 3]'),
 Text(286.1780636425186, 234.83520000000001, 'X[3] <= 0.637\nentropy = 0.811\nsamples = 4\nvalue = [3, 1]'),
```

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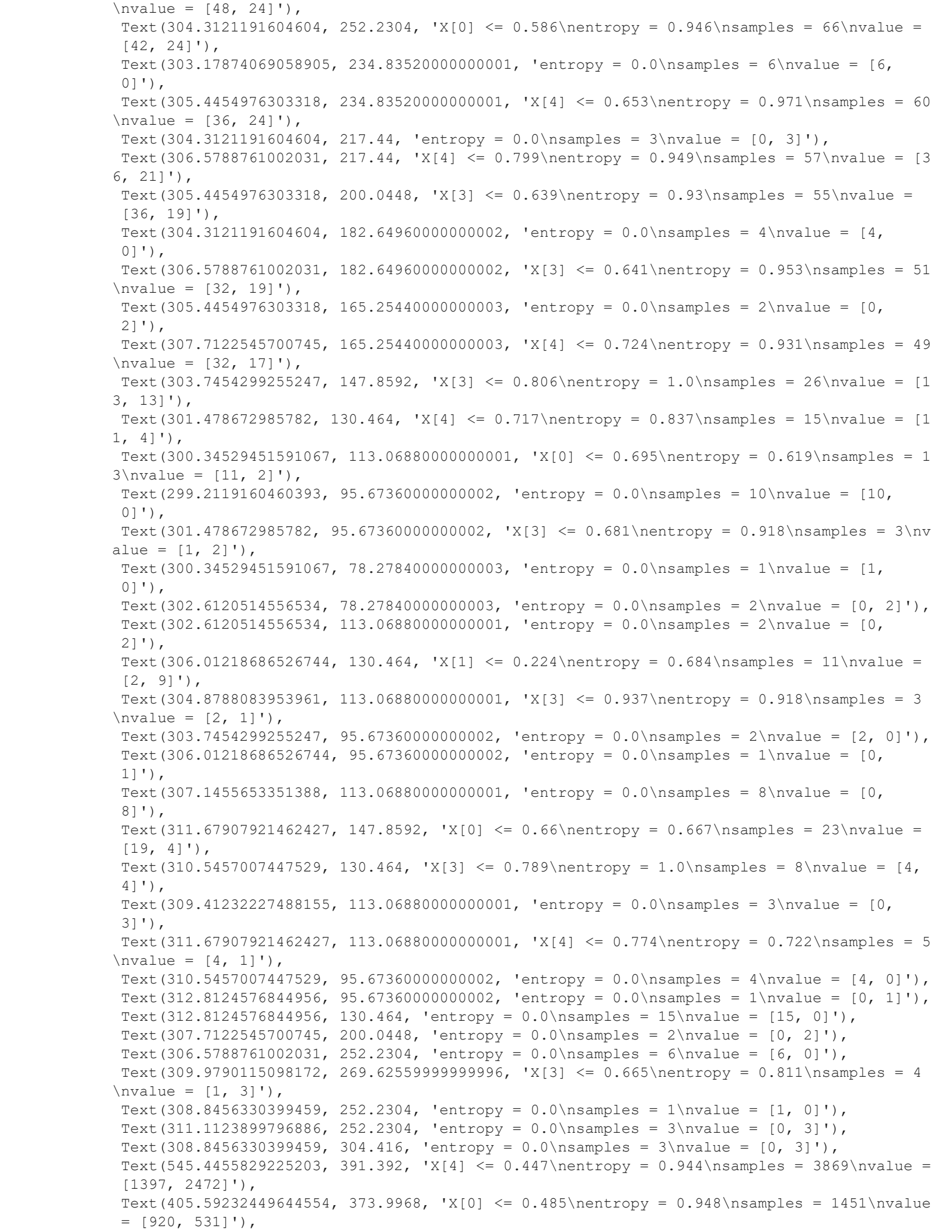
 Text(285.0446851726473, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(287.31144211239, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(288.44482058226134, 234.83520000000001, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(288.44482058226134, 304.416, 'X[3] <= 0.295\nentropy = 0.449\nsamples = 32\nvalue =
 [3, 29]'),
 Text(287.31144211239, 287.0208, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(289.57819905213273, 287.0208, 'entropy = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(297.5118483412322, 356.6016, 'X[3] <= 0.491\nentropy = 1.0\nsamples = 146\nvalue =
 [72, 74]'),
 Text(292.9783344617468, 339.20640000000003, 'X[4] <= 0.718\nentropy = 0.592\nsamples = 28
\nvalue = [4, 24]'),
 Text(291.84495599187545, 321.8112, 'X[1] <= 0.261\nentropy = 0.991\nsamples = 9\nvalue =
 [4, 5]'),
 Text(290.71157752200406, 304.416, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(292.9783344617468, 304.416, 'X[3] <= 0.331\nentropy = 0.863\nsamples = 7\nvalue =
 [2, 5]'),
 Text(291.84495599187545, 287.0208, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(294.1117129316182, 287.0208, 'X[2] <= 0.238\nentropy = 0.65\nsamples = 6\nvalue =
 [1, 5]'),
 Text(292.9783344617468, 269.62559999999996, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(295.2450914014895, 269.62559999999996, 'entropy = 0.0\nsamples = 5\nvalue = [0,
 5]'),
 Text(294.1117129316182, 321.8112, 'entropy = 0.0\nsamples = 19\nvalue = [0, 19]'),
 Text(302.04536222071766, 339.20640000000003, 'X[3] <= 0.603\nentropy = 0.983\nsamples = 1
18\nvalue = [68, 50]'),
 Text(296.3784698713609, 321.8112, 'X[0] <= 0.662\nentropy = 0.977\nsamples = 34\nvalue =
 [14, 20]'),
 Text(295.2450914014895, 304.416, 'entropy = 0.0\nsamples = 11\nvalue = [0, 11]'),
 Text(297.5118483412322, 304.416, 'X[3] <= 0.497\nentropy = 0.966\nsamples = 23\nvalue =
 [14, 9]'),
 Text(296.3784698713609, 287.0208, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(298.6452268111036, 287.0208, 'X[2] <= 0.644\nentropy = 0.993\nsamples = 20\nvalue =
 [11, 9]'),
 Text(297.5118483412322, 269.62559999999996, 'X[0] <= 0.687\nentropy = 0.998\nsamples = 17
\nvalue = [8, 9]'),
 Text(296.3784698713609, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(298.6452268111036, 252.2304, 'X[3] <= 0.565\nentropy = 0.985\nsamples = 14\nvalue =
 [8, 6]'),
 Text(296.3784698713609, 234.83520000000001, 'X[4] <= 0.671\nentropy = 0.954\nsamples = 8
\nvalue = [3, 5]'),
 Text(295.2450914014895, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(297.5118483412322, 217.44, 'X[1] <= 0.251\nentropy = 1.0\nsamples = 6\nvalue = [3,
 3]'),
 Text(296.3784698713609, 200.0448, 'X[2] <= 0.595\nentropy = 0.811\nsamples = 4\nvalue =
 [3, 1]'),
 Text(295.2450914014895, 182.64960000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(297.5118483412322, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(298.6452268111036, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(300.91198375084633, 234.83520000000001, 'X[2] <= 0.397\nentropy = 0.65\nsamples = 6
\nvalue = [5, 1]'),
 Text(299.77860528097494, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(302.04536222071766, 217.44, 'entropy = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(299.77860528097494, 269.62559999999996, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(307.7122545700745, 321.8112, 'X[0] <= 0.825\nentropy = 0.94\nsamples = 84\nvalue =
 [54, 30]'),
 Text(306.5788761002031, 304.416, 'X[3] <= 0.626\nentropy = 0.918\nsamples = 81\nvalue =
 [54, 27]'),
 Text(305.4454976303318, 287.0208, 'entropy = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(307.7122545700745, 287.0208, 'X[4] <= 0.856\nentropy = 0.939\nsamples = 76\nvalue =
 [49, 27]'),
 Text(305.4454976303318, 269.62559999999996, 'X[4] <= 0.811\nentropy = 0.918\nsamples = 72
```


\nvalue = [48, 24]'),
Text(304.3121191604604, 252.2304, 'X[0] <= 0.586\nentropy = 0.946\nsamples = 66\nvalue = [42, 24]'),
Text(303.17874069058905, 234.83520000000001, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
Text(305.4454976303318, 234.83520000000001, 'X[4] <= 0.653\nentropy = 0.971\nsamples = 60\nvalue = [36, 24]'),
Text(304.3121191604604, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(306.5788761002031, 217.44, 'X[4] <= 0.799\nentropy = 0.949\nsamples = 57\nvalue = [36, 21]'),
Text(305.4454976303318, 200.0448, 'X[3] <= 0.639\nentropy = 0.93\nsamples = 55\nvalue = [36, 19]'),
Text(304.3121191604604, 182.64960000000002, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
Text(306.5788761002031, 182.64960000000002, 'X[3] <= 0.641\nentropy = 0.953\nsamples = 51\nvalue = [32, 19]'),
Text(305.4454976303318, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(307.7122545700745, 165.25440000000003, 'X[4] <= 0.724\nentropy = 0.931\nsamples = 49\nvalue = [32, 17]'),
Text(303.7454299255247, 147.8592, 'X[3] <= 0.806\nentropy = 1.0\nsamples = 26\nvalue = [13, 13]'),
Text(301.478672985782, 130.464, 'X[4] <= 0.717\nentropy = 0.837\nsamples = 15\nvalue = [11, 4]'),
Text(300.34529451591067, 113.06880000000001, 'X[0] <= 0.695\nentropy = 0.619\nsamples = 13\nvalue = [11, 2]'),
Text(299.2119160460393, 95.67360000000002, 'entropy = 0.0\nsamples = 10\nvalue = [10, 0]'),
Text(301.478672985782, 95.67360000000002, 'X[3] <= 0.681\nentropy = 0.918\nsamples = 3\nvalue = [1, 2]'),
Text(300.34529451591067, 78.27840000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(302.6120514556534, 78.27840000000003, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(302.6120514556534, 113.06880000000001, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(306.01218686526744, 130.464, 'X[1] <= 0.224\nentropy = 0.684\nsamples = 11\nvalue = [2, 9]'),
Text(304.8788083953961, 113.06880000000001, 'X[3] <= 0.937\nentropy = 0.918\nsamples = 3\nvalue = [2, 1]'),
Text(303.7454299255247, 95.67360000000002, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(306.01218686526744, 95.67360000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(307.1455653351388, 113.06880000000001, 'entropy = 0.0\nsamples = 8\nvalue = [0, 8]'),
Text(311.67907921462427, 147.8592, 'X[0] <= 0.66\nentropy = 0.667\nsamples = 23\nvalue = [19, 4]'),
Text(310.5457007447529, 130.464, 'X[3] <= 0.789\nentropy = 1.0\nsamples = 8\nvalue = [4, 4]'),
Text(309.41232227488155, 113.06880000000001, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(311.67907921462427, 113.06880000000001, 'X[4] <= 0.774\nentropy = 0.722\nsamples = 5\nvalue = [4, 1]'),
Text(310.5457007447529, 95.67360000000002, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
Text(312.8124576844956, 95.67360000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(312.8124576844956, 130.464, 'entropy = 0.0\nsamples = 15\nvalue = [15, 0]'),
Text(307.7122545700745, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(306.5788761002031, 252.2304, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
Text(309.97901150981720, 269.62559999999996, 'X[3] <= 0.665\nentropy = 0.811\nsamples = 4\nvalue = [1, 3]'),
Text(308.8456330399459, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(311.1123899796886, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(308.8456330399459, 304.416, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(545.4455829225203, 391.392, 'X[4] <= 0.447\nentropy = 0.944\nsamples = 3869\nvalue = [1397, 2472]'),
Text(405.59232449644554, 373.9968, 'X[0] <= 0.485\nentropy = 0.948\nsamples = 1451\nvalue = [920, 531]'),

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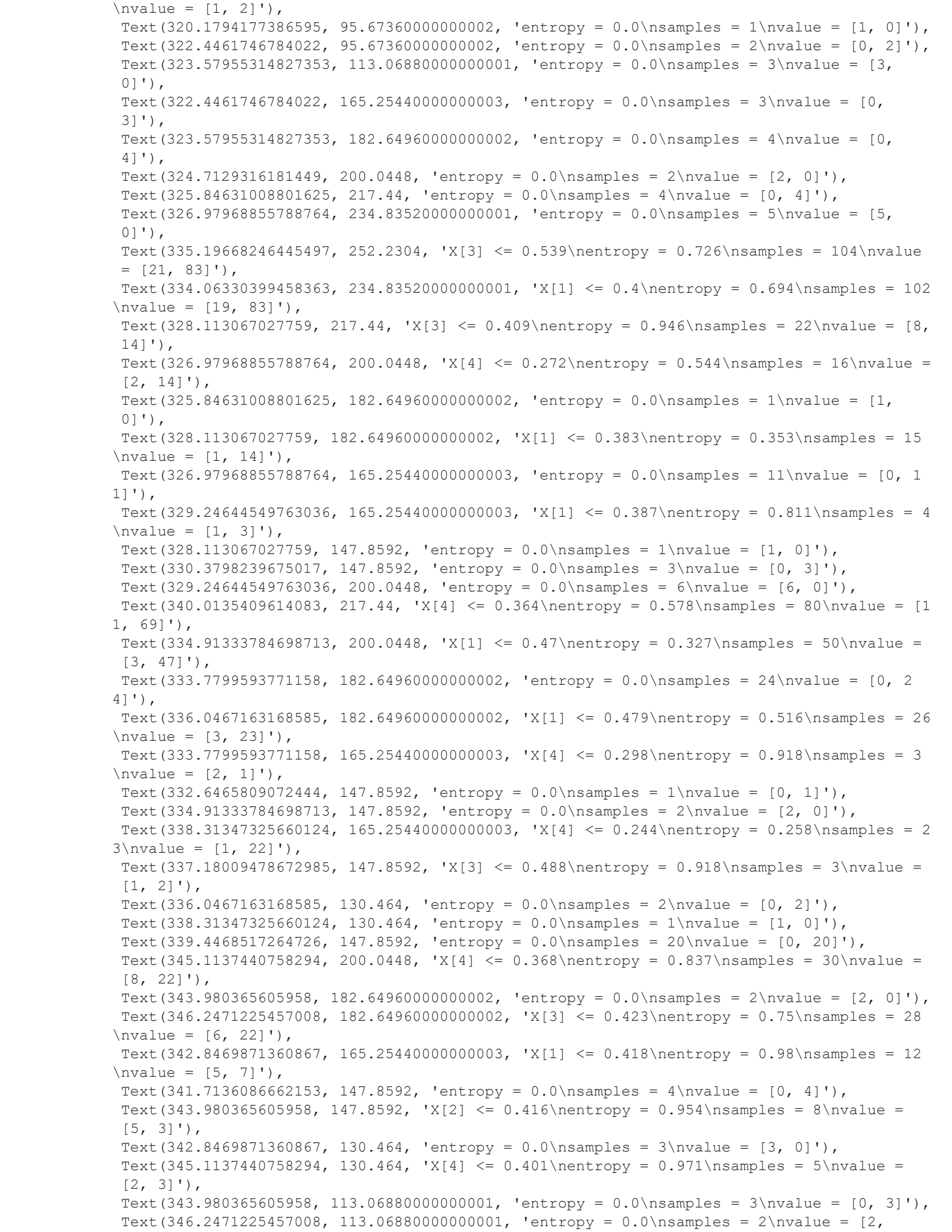
 Text(325.1246667654029, 356.6016, 'X[3] <= 0.197\nentropy = 0.901\nsamples = 338\nvalue =
 [107, 231]'),
 Text(311.1123899796886, 339.20640000000003, 'X[1] <= 0.315\nentropy = 0.592\nsamples = 7
\nvalue = [6, 1]'),
 Text(309.9790115098172, 321.8112, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(312.24576844955993, 321.8112, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(339.13694355111716, 339.20640000000003, 'X[4] <= 0.234\nentropy = 0.887\nsamples = 3
31\nvalue = [101, 230]'),
 Text(314.51252538930265, 321.8112, 'X[1] <= 0.421\nentropy = 0.644\nsamples = 61\nvalue =
 [10, 51]'),
 Text(313.3791469194313, 304.416, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(315.64590385917404, 304.416, 'X[3] <= 0.559\nentropy = 0.531\nsamples = 58\nvalue =
 [7, 51]'),
 Text(314.51252538930265, 287.0208, 'entropy = 0.0\nsamples = 23\nvalue = [0, 23]'),
 Text(316.7792823290454, 287.0208, 'X[3] <= 0.568\nentropy = 0.722\nsamples = 35\nvalue =
 [7, 28]'),
 Text(315.64590385917404, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(317.91266079891676, 269.62559999999996, 'X[1] <= 0.806\nentropy = 0.614\nsamples = 3
3\nvalue = [5, 28]'),
 Text(314.51252538930265, 252.2304, 'X[0] <= 0.477\nentropy = 0.381\nsamples = 27\nvalue =
 [2, 25]'),
 Text(313.3791469194313, 234.83520000000001, 'entropy = 0.0\nsamples = 21\nvalue = [0, 2
1]'),
 Text(315.64590385917404, 234.83520000000001, 'X[2] <= 0.498\nentropy = 0.918\nsamples = 6
\nvalue = [2, 4]'),
 Text(314.51252538930265, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(316.7792823290454, 217.44, 'X[3] <= 0.687\nentropy = 0.918\nsamples = 3\nvalue = [2,
 1]'),
 Text(315.64590385917404, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(317.91266079891676, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(321.3127962085308, 252.2304, 'X[0] <= 0.474\nentropy = 1.0\nsamples = 6\nvalue = [3,
 3]'),
 Text(320.1794177386595, 234.83520000000001, 'X[0] <= 0.433\nentropy = 0.811\nsamples = 4
\nvalue = [3, 1]'),
 Text(319.0460392687881, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(321.3127962085308, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(322.4461746784022, 234.83520000000001, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(363.76136171293166, 321.8112, 'X[1] <= 0.653\nentropy = 0.922\nsamples = 270\nvalue
 = [91, 179]'),
 Text(353.50782836831416, 304.416, 'X[3] <= 0.55\nentropy = 0.868\nsamples = 228\nvalue =
 [66, 162]'),
 Text(341.50110020311445, 287.0208, 'X[1] <= 0.537\nentropy = 0.924\nsamples = 168\nvalue
 = [57, 111]'),
 Text(330.5214962762356, 269.62559999999996, 'X[3] <= 0.32\nentropy = 0.82\nsamples = 133
\nvalue = [34, 99]'),
 Text(325.84631008801625, 252.2304, 'X[1] <= 0.462\nentropy = 0.992\nsamples = 29\nvalue =
 [13, 16]'),
 Text(324.7129316181449, 234.83520000000001, 'X[4] <= 0.417\nentropy = 0.918\nsamples = 24
\nvalue = [8, 16]'),
 Text(323.57955314827353, 217.44, 'X[4] <= 0.394\nentropy = 0.971\nsamples = 20\nvalue =
 [8, 12]'),
 Text(322.4461746784022, 200.0448, 'X[4] <= 0.333\nentropy = 0.918\nsamples = 18\nvalue =
 [6, 12]'),
 Text(321.3127962085308, 182.64960000000002, 'X[1] <= 0.422\nentropy = 0.985\nsamples = 14
\nvalue = [6, 8]'),
 Text(320.1794177386595, 165.25440000000003, 'X[0] <= 0.441\nentropy = 0.994\nsamples = 11
\nvalue = [6, 5]'),
 Text(319.0460392687881, 147.8592, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(321.3127962085308, 147.8592, 'X[0] <= 0.462\nentropy = 0.991\nsamples = 9\nvalue =
 [4, 5]'),
 Text(320.1794177386595, 130.464, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(322.4461746784022, 130.464, 'X[3] <= 0.279\nentropy = 0.918\nsamples = 6\nvalue =
 [4, 2]'),
 Text(321.3127962085308, 113.06880000000001, 'X[4] <= 0.292\nentropy = 0.918\nsamples = 3
```


\nvalue = [1, 2]'),
Text(320.1794177386595, 95.67360000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(322.4461746784022, 95.67360000000002, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(323.57955314827353, 113.06880000000001, 'entropy = 0.0\nsamples = 3\nvalue = [3,
0]'),
Text(322.4461746784022, 165.25440000000003, 'entropy = 0.0\nsamples = 3\nvalue = [0,
3]'),
Text(323.57955314827353, 182.64960000000002, 'entropy = 0.0\nsamples = 4\nvalue = [0,
4]'),
Text(324.7129316181449, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(325.84631008801625, 217.44, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
Text(326.97968855788764, 234.83520000000001, 'entropy = 0.0\nsamples = 5\nvalue = [5,
0]'),
Text(335.19668246445497, 252.2304, 'X[3] <= 0.539\nentropy = 0.726\nsamples = 104\nvalue
= [21, 83]'),
Text(334.06330399458363, 234.83520000000001, 'X[1] <= 0.4\nentropy = 0.694\nsamples = 102
\nvalue = [19, 83]'),
Text(328.113067027759, 217.44, 'X[3] <= 0.409\nentropy = 0.946\nsamples = 22\nvalue = [8,
14]'),
Text(326.97968855788764, 200.0448, 'X[4] <= 0.272\nentropy = 0.544\nsamples = 16\nvalue =
[2, 14]'),
Text(325.84631008801625, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
Text(328.113067027759, 182.64960000000002, 'X[1] <= 0.383\nentropy = 0.353\nsamples = 15
\nvalue = [1, 14]'),
Text(326.97968855788764, 165.25440000000003, 'entropy = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
Text(329.24644549763036, 165.25440000000003, 'X[1] <= 0.387\nentropy = 0.811\nsamples = 4
\nvalue = [1, 3]'),
Text(328.113067027759, 147.8592, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(330.3798239675017, 147.8592, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(329.24644549763036, 200.0448, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
Text(340.0135409614083, 217.44, 'X[4] <= 0.364\nentropy = 0.578\nsamples = 80\nvalue = [1
1, 69]'),
Text(334.91333784698713, 200.0448, 'X[1] <= 0.47\nentropy = 0.327\nsamples = 50\nvalue =
[3, 47]'),
Text(333.7799593771158, 182.64960000000002, 'entropy = 0.0\nsamples = 24\nvalue = [0, 2
4]'),
Text(336.0467163168585, 182.64960000000002, 'X[1] <= 0.479\nentropy = 0.516\nsamples = 26
\nvalue = [3, 23]'),
Text(333.7799593771158, 165.25440000000003, 'X[4] <= 0.298\nentropy = 0.918\nsamples = 3
\nvalue = [2, 1]'),
Text(332.6465809072444, 147.8592, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(334.91333784698713, 147.8592, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(338.31347325660124, 165.25440000000003, 'X[4] <= 0.244\nentropy = 0.258\nsamples = 2
3\nvalue = [1, 22]'),
Text(337.18009478672985, 147.8592, 'X[3] <= 0.488\nentropy = 0.918\nsamples = 3\nvalue =
[1, 2]'),
Text(336.0467163168585, 130.464, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(338.31347325660124, 130.464, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(339.4468517264726, 147.8592, 'entropy = 0.0\nsamples = 20\nvalue = [0, 20]'),
Text(345.1137440758294, 200.0448, 'X[4] <= 0.368\nentropy = 0.837\nsamples = 30\nvalue =
[8, 22]'),
Text(343.980365605958, 182.64960000000002, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(346.2471225457008, 182.64960000000002, 'X[3] <= 0.423\nentropy = 0.75\nsamples = 28
\nvalue = [6, 22]'),
Text(342.8469871360867, 165.25440000000003, 'X[1] <= 0.418\nentropy = 0.98\nsamples = 12
\nvalue = [5, 7]'),
Text(341.7136086662153, 147.8592, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
Text(343.980365605958, 147.8592, 'X[2] <= 0.416\nentropy = 0.954\nsamples = 8\nvalue =
[5, 3]'),
Text(342.8469871360867, 130.464, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(345.1137440758294, 130.464, 'X[4] <= 0.401\nentropy = 0.971\nsamples = 5\nvalue =
[2, 3]'),
Text(343.980365605958, 113.06880000000001, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(346.2471225457008, 113.06880000000001, 'entropy = 0.0\nsamples = 2\nvalue = [2,

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 0]'),
 Text(349.64725795531484, 165.25440000000003, 'X[4] <= 0.374\nentropy = 0.337\nsamples = 1
6\nvalue = [1, 15]'),
 Text(348.5138794854435, 147.8592, 'X[1] <= 0.475\nentropy = 1.0\nsamples = 2\nvalue = [1,
 1]'),
 Text(347.3805010155721, 130.464, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(349.64725795531484, 130.464, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(350.78063642518623, 147.8592, 'entropy = 0.0\nsamples = 14\nvalue = [0, 14]'),
 Text(336.33006093432635, 234.83520000000001, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(352.4807041299932, 269.62559999999996, 'X[4] <= 0.365\nentropy = 0.928\nsamples = 35
\nvalue = [23, 12]'),
 Text(349.64725795531484, 252.2304, 'X[2] <= 0.447\nentropy = 1.0\nsamples = 22\nvalue =
 [11, 11]'),
 Text(347.3805010155721, 234.83520000000001, 'X[3] <= 0.437\nentropy = 0.503\nsamples = 9
\nvalue = [1, 8]'),
 Text(346.2471225457008, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(348.5138794854435, 217.44, 'entropy = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(351.91401489505756, 234.83520000000001, 'X[4] <= 0.308\nentropy = 0.779\nsamples = 1
3\nvalue = [10, 3]'),
 Text(350.78063642518623, 217.44, 'entropy = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(353.04739336492895, 217.44, 'X[0] <= 0.443\nentropy = 1.0\nsamples = 6\nvalue = [3,
 3]'),
 Text(351.91401489505756, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(354.1807718348003, 200.0448, 'X[3] <= 0.525\nentropy = 0.811\nsamples = 4\nvalue =
 [1, 3]'),
 Text(353.04739336492895, 182.64960000000002, 'X[0] <= 0.472\nentropy = 1.0\nsamples = 2\n
value = [1, 1]'),
 Text(351.91401489505756, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(354.1807718348003, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(355.31415030467167, 182.64960000000002, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(355.31415030467167, 252.2304, 'X[4] <= 0.417\nentropy = 0.391\nsamples = 13\nvalue =
 [12, 1]'),
 Text(354.1807718348003, 234.83520000000001, 'entropy = 0.0\nsamples = 8\nvalue = [8,
 0]'),
 Text(356.447528774543, 234.83520000000001, 'X[4] <= 0.425\nentropy = 0.722\nsamples = 5\n
value = [4, 1]'),
 Text(355.31415030467167, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(357.5809072444144, 217.44, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(365.5145565335139, 287.0208, 'X[1] <= 0.579\nentropy = 0.61\nsamples = 60\nvalue =
 [9, 51]'),
 Text(364.38117806364255, 269.62559999999996, 'X[3] <= 0.588\nentropy = 0.881\nsamples = 3
0\nvalue = [9, 21]'),
 Text(362.11442112389983, 252.2304, 'X[0] <= 0.431\nentropy = 0.323\nsamples = 17\nvalue =
 [1, 16]'),
 Text(360.98104265402844, 234.83520000000001, 'X[4] <= 0.27\nentropy = 1.0\nsamples = 2\nv
alue = [1, 1]'),
 Text(359.8476641841571, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(362.11442112389983, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(363.24779959377116, 234.83520000000001, 'entropy = 0.0\nsamples = 15\nvalue = [0, 1
5]'),
 Text(366.64793500338527, 252.2304, 'X[4] <= 0.397\nentropy = 0.961\nsamples = 13\nvalue =
 [8, 5]'),
 Text(365.5145565335139, 234.83520000000001, 'X[3] <= 0.596\nentropy = 0.722\nsamples = 10
\nvalue = [8, 2]'),
 Text(364.38117806364255, 217.44, 'X[0] <= 0.472\nentropy = 0.918\nsamples = 3\nvalue =
 [1, 2]'),
 Text(363.24779959377116, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(365.5145565335139, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(366.64793500338527, 217.44, 'entropy = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(367.7813134732566, 234.83520000000001, 'entropy = 0.0\nsamples = 3\nvalue = [0,
 3]'),
 Text(366.64793500338527, 269.62559999999996, 'entropy = 0.0\nsamples = 30\nvalue = [0, 3
```

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0]'),
 Text(374.0148950575491, 304.416, 'X[3] <= 0.621\nentropy = 0.974\nsamples = 42\nvalue =
 [25, 17]'),
 Text(370.0480704129993, 287.0208, 'X[3] <= 0.342\nentropy = 0.684\nsamples = 22\nvalue =
 [18, 4]'),
 Text(368.914691943128, 269.62559999999996, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(371.1814488828707, 269.62559999999996, 'X[2] <= 0.225\nentropy = 0.469\nsamples = 20
\nvalue = [18, 2]'),
 Text(370.0480704129993, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(372.31482735274204, 252.2304, 'X[0] <= 0.439\nentropy = 0.297\nsamples = 19\nvalue =
 [18, 1]'),
 Text(371.1814488828707, 234.83520000000001, 'X[0] <= 0.434\nentropy = 0.722\nsamples = 5
\nvalue = [4, 1]'),
 Text(370.0480704129993, 217.44, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(372.31482735274204, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(373.44820582261343, 234.83520000000001, 'entropy = 0.0\nsamples = 14\nvalue = [14,
 0]'),
 Text(377.98171970209887, 287.0208, 'X[0] <= 0.464\nentropy = 0.934\nsamples = 20\nvalue =
 [7, 13]'),
 Text(375.71496276235615, 269.62559999999996, 'X[1] <= 0.662\nentropy = 0.592\nsamples = 1
4\nvalue = [2, 12]'),
 Text(374.58158429248476, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(376.8483412322275, 252.2304, 'X[3] <= 0.686\nentropy = 0.391\nsamples = 13\nvalue =
 [1, 12]'),
 Text(375.71496276235615, 234.83520000000001, 'X[2] <= 0.473\nentropy = 0.811\nsamples = 4
\nvalue = [1, 3]'),
 Text(374.58158429248476, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(376.8483412322275, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(377.98171970209887, 234.83520000000001, 'entropy = 0.0\nsamples = 9\nvalue = [0,
 9]'),
 Text(380.2484766418416, 269.62559999999996, 'X[2] <= 0.502\nentropy = 0.65\nsamples = 6\n
value = [5, 1]'),
 Text(379.1150981719702, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(381.381855111713, 252.2304, 'entropy = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(486.0599822274882, 356.6016, 'X[4] <= 0.369\nentropy = 0.841\nsamples = 1113\nvalue
 = [813, 300]'),
 Text(438.82997630331755, 339.20640000000003, 'X[0] <= 0.583\nentropy = 0.69\nsamples = 74
7\nvalue = [609, 138]'),
 Text(409.57464454976304, 321.8112, 'X[3] <= 0.488\nentropy = 0.954\nsamples = 270\nvalue
 = [169, 101]'),
 Text(396.39911983750847, 304.416, 'X[2] <= 0.479\nentropy = 1.0\nsamples = 104\nvalue =
 [52, 52]'),
 Text(387.6154366960054, 287.0208, 'X[4] <= 0.342\nentropy = 0.926\nsamples = 41\nvalue =
 [14, 27]'),
 Text(384.78199052132703, 269.62559999999996, 'X[4] <= 0.337\nentropy = 0.981\nsamples = 3
1\nvalue = [13, 18]'),
 Text(383.6486120514557, 252.2304, 'X[0] <= 0.546\nentropy = 0.958\nsamples = 29\nvalue =
 [11, 18]'),
 Text(381.381855111713, 234.83520000000001, 'X[4] <= 0.259\nentropy = 0.787\nsamples = 17
\nvalue = [4, 13]'),
 Text(380.2484766418416, 217.44, 'entropy = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(382.5152335815843, 217.44, 'X[4] <= 0.288\nentropy = 0.971\nsamples = 10\nvalue =
 [4, 6]'),
 Text(381.381855111713, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(383.6486120514557, 200.0448, 'X[3] <= 0.383\nentropy = 0.811\nsamples = 8\nvalue =
 [2, 6]'),
 Text(382.5152335815843, 182.64960000000002, 'entropy = 0.0\nsamples = 5\nvalue = [0,
 5]'),
 Text(384.78199052132703, 182.64960000000002, 'X[0] <= 0.507\nentropy = 0.918\nsamples = 3
\nvalue = [2, 1]'),
 Text(383.6486120514557, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(385.9153689911984, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(385.9153689911984, 234.83520000000001, 'X[2] <= 0.263\nentropy = 0.98\nsamples = 12
\nvalue = [7, 5]'),
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 Text(384.78199052132703, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(387.04874746106975, 217.44, 'X[1] <= 0.3\nentropy = 0.881\nsamples = 10\nvalue = [7,
 3]'),
 Text(385.9153689911984, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(388.18212593094114, 200.0448, 'X[1] <= 0.512\nentropy = 0.764\nsamples = 9\nvalue =
 [7, 2]'),
 Text(387.04874746106975, 182.64960000000002, 'entropy = 0.0\nsamples = 6\nvalue = [6,
 0]'),
 Text(389.3155044008125, 182.64960000000002, 'X[3] <= 0.314\nentropy = 0.918\nsamples = 3
\nvalue = [1, 2]'),
 Text(388.18212593094114, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(390.44888287068386, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(385.9153689911984, 252.2304, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(390.44888287068386, 269.62559999999996, 'X[0] <= 0.5\nentropy = 0.469\nsamples = 10
\nvalue = [1, 9]'),
 Text(389.3155044008125, 252.2304, 'X[4] <= 0.358\nentropy = 1.0\nsamples = 2\nvalue = [1,
 1]'),
 Text(388.18212593094114, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(390.44888287068386, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(391.5822613405552, 252.2304, 'entropy = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(405.1828029790115, 287.0208, 'X[1] <= 0.498\nentropy = 0.969\nsamples = 63\nvalue =
 [38, 25]'),
 Text(401.78266756939746, 269.62559999999996, 'X[2] <= 0.705\nentropy = 0.876\nsamples = 4
4\nvalue = [31, 13]'),
 Text(400.6492890995261, 252.2304, 'X[3] <= 0.417\nentropy = 0.96\nsamples = 34\nvalue =
 [21, 13]'),
 Text(398.38253215978335, 234.83520000000001, 'X[2] <= 0.623\nentropy = 0.999\nsamples = 2
3\nvalue = [11, 12]'),
 Text(397.249153689912, 217.44, 'X[1] <= 0.44\nentropy = 0.982\nsamples = 19\nvalue = [11,
 8]'),
 Text(396.11577522004063, 200.0448, 'X[0] <= 0.533\nentropy = 0.997\nsamples = 15\nvalue =
 [7, 8]'),
 Text(393.8490182802979, 182.64960000000002, 'X[2] <= 0.613\nentropy = 0.592\nsamples = 7
\nvalue = [1, 6]'),
 Text(392.7156398104266, 165.25440000000003, 'entropy = 0.0\nsamples = 6\nvalue = [0,
 6]'),
 Text(394.9823967501693, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(398.38253215978335, 182.64960000000002, 'X[4] <= 0.254\nentropy = 0.811\nsamples = 8
\nvalue = [6, 2]'),
 Text(397.249153689912, 165.25440000000003, 'X[2] <= 0.512\nentropy = 0.918\nsamples = 3\n
value = [1, 2]'),
 Text(396.11577522004063, 147.8592, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(398.38253215978335, 147.8592, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(399.51591062965474, 165.25440000000003, 'entropy = 0.0\nsamples = 5\nvalue = [5,
 0]'),
 Text(398.38253215978335, 200.0448, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(399.51591062965474, 217.44, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(402.9160460392688, 234.83520000000001, 'X[2] <= 0.7\nentropy = 0.439\nsamples = 11\n
value = [10, 1]'),
 Text(401.78266756939746, 217.44, 'entropy = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(404.0494245091402, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(402.9160460392688, 252.2304, 'entropy = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(408.5829383886256, 269.62559999999996, 'X[1] <= 0.575\nentropy = 0.949\nsamples = 19
\nvalue = [7, 12]'),
 Text(406.3161814488829, 252.2304, 'X[3] <= 0.337\nentropy = 0.414\nsamples = 12\nvalue =
 [1, 11]'),
 Text(405.1828029790115, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(407.44955991875423, 234.83520000000001, 'entropy = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
 Text(410.84969532836834, 252.2304, 'X[4] <= 0.238\nentropy = 0.592\nsamples = 7\nvalue =
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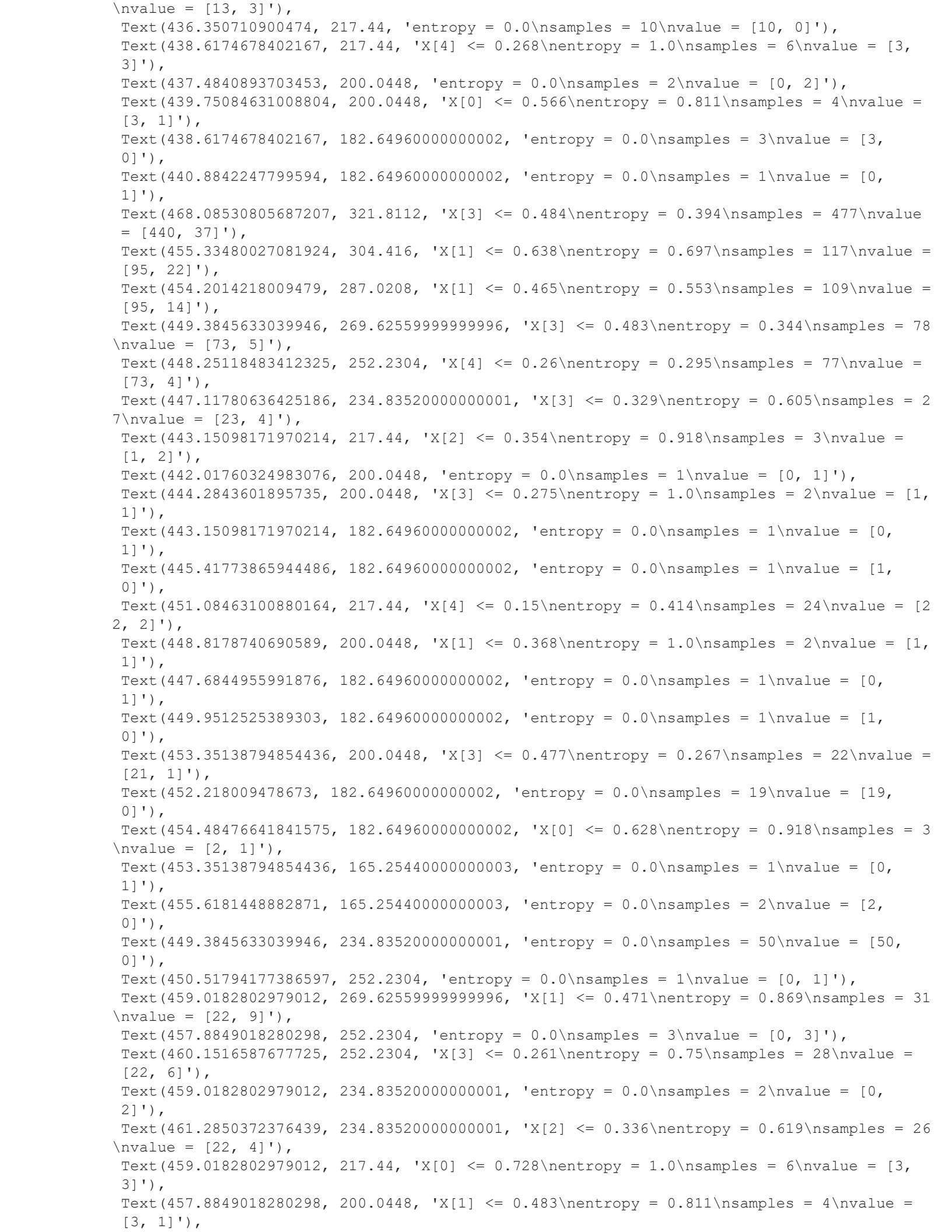
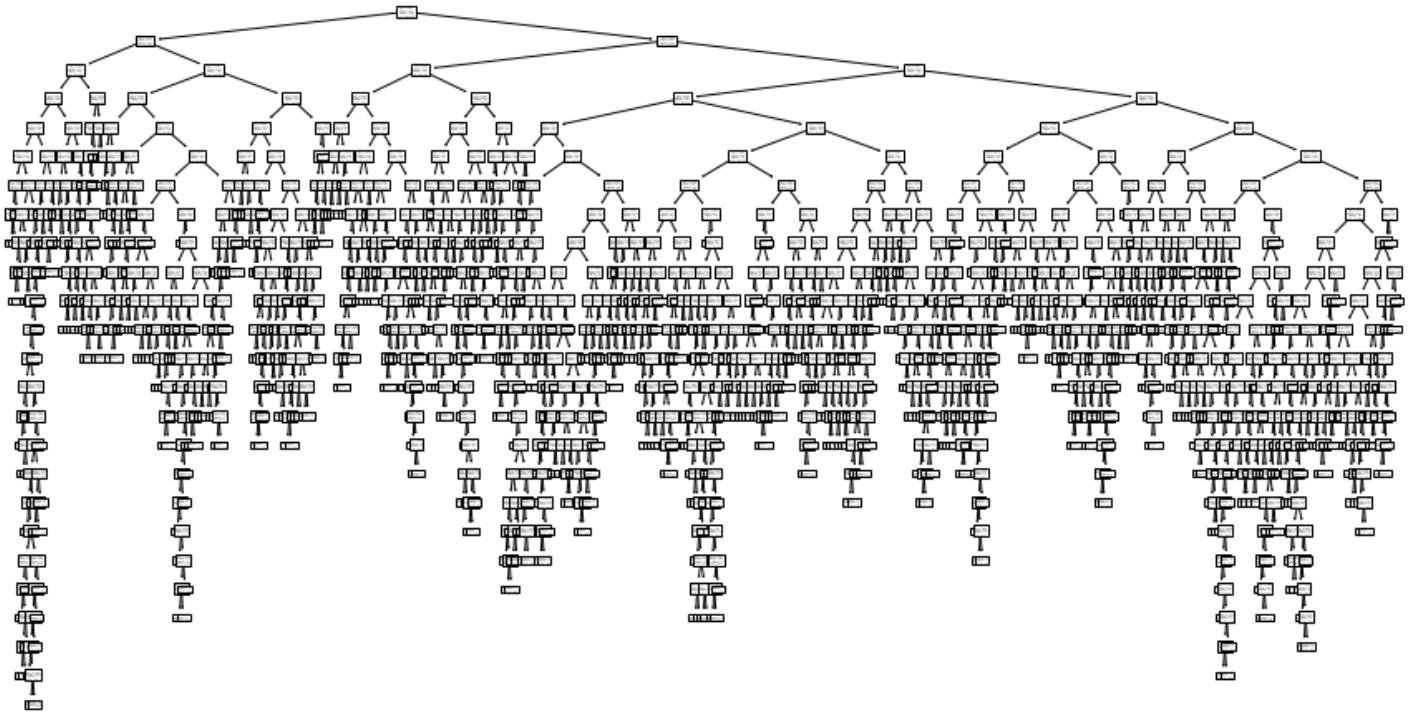
 [6, 1]'),
 Text(409.71631685849695, 234.83520000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(411.9830737982397, 234.83520000000001, 'entropy = 0.0\nsamples = 6\nvalue = [6,
 0]'),
 Text(422.7501692620176, 304.416, 'X[3] <= 0.501\nentropy = 0.875\nsamples = 166\nvalue =
 [117, 49]'),
 Text(421.6167907921463, 287.0208, 'entropy = 0.0\nsamples = 11\nvalue = [11, 0]'),
 Text(423.883547731889, 287.0208, 'X[0] <= 0.544\nentropy = 0.9\nsamples = 155\nvalue = [1
06, 49]'),
 Text(417.6499661475965, 269.62559999999996, 'X[3] <= 0.718\nentropy = 0.957\nsamples = 10
3\nvalue = [64, 39]'),
 Text(415.3832092078538, 252.2304, 'X[1] <= 0.756\nentropy = 0.922\nsamples = 92\nvalue =
 [61, 31]'),
 Text(414.2498307379824, 234.83520000000001, 'X[4] <= 0.175\nentropy = 0.95\nsamples = 84
\nvalue = [53, 31]'),
 Text(413.11645226811106, 217.44, 'entropy = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(415.3832092078538, 217.44, 'X[4] <= 0.207\nentropy = 0.966\nsamples = 79\nvalue = [4
8, 31]'),
 Text(410.2830060934327, 200.0448, 'X[4] <= 0.193\nentropy = 0.881\nsamples = 10\nvalue =
 [3, 7]'),
 Text(409.1496276235613, 182.64960000000002, 'X[4] <= 0.187\nentropy = 0.971\nsamples = 5
\nvalue = [3, 2]'),
 Text(408.01624915368996, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [0,
 2]'),
 Text(410.2830060934327, 165.25440000000003, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(411.416384563304, 182.64960000000002, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(420.4834123222749, 200.0448, 'X[1] <= 0.631\nentropy = 0.932\nsamples = 69\nvalue =
 [45, 24]'),
 Text(415.94989844278945, 182.64960000000002, 'X[4] <= 0.274\nentropy = 0.991\nsamples = 4
5\nvalue = [25, 20]'),
 Text(412.5497630331754, 165.25440000000003, 'X[1] <= 0.572\nentropy = 0.722\nsamples = 15
\nvalue = [12, 3]'),
 Text(411.416384563304, 147.8592, 'entropy = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(413.6831415030467, 147.8592, 'X[2] <= 0.324\nentropy = 0.971\nsamples = 5\nvalue =
 [2, 3]'),
 Text(412.5497630331754, 130.464, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(414.8165199729181, 130.464, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(419.35003385240356, 165.25440000000003, 'X[2] <= 0.78\nentropy = 0.987\nsamples = 30
\nvalue = [13, 17]'),
 Text(418.21665538253217, 147.8592, 'X[1] <= 0.598\nentropy = 0.951\nsamples = 27\nvalue =
 [10, 17]'),
 Text(417.08327691266084, 130.464, 'X[1] <= 0.556\nentropy = 0.994\nsamples = 22\nvalue =
 [10, 12]'),
 Text(415.94989844278945, 113.06880000000001, 'X[3] <= 0.514\nentropy = 0.918\nsamples = 1
8\nvalue = [6, 12]'),
 Text(414.8165199729181, 95.67360000000002, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(417.08327691266084, 95.67360000000002, 'X[3] <= 0.541\nentropy = 0.996\nsamples = 13
\nvalue = [6, 7]'),
 Text(414.8165199729181, 78.27840000000003, 'X[0] <= 0.489\nentropy = 0.863\nsamples = 7\n
value = [5, 2]'),
 Text(413.6831415030467, 60.88319999999999, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(415.94989844278945, 60.88319999999999, 'entropy = 0.0\nsamples = 5\nvalue = [5,
 0]'),
 Text(419.35003385240356, 78.27840000000003, 'X[3] <= 0.595\nentropy = 0.65\nsamples = 6\n
value = [1, 5]'),
 Text(418.21665538253217, 60.88319999999999, 'entropy = 0.0\nsamples = 5\nvalue = [0,
 5]'),
 Text(420.4834123222749, 60.88319999999999, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(418.21665538253217, 113.06880000000001, 'entropy = 0.0\nsamples = 4\nvalue = [4,
 0]'),
 Text(419.35003385240356, 130.464, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(420.4834123222749, 147.8592, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(425.0169262017603, 182.64960000000002, 'X[1] <= 0.742\nentropy = 0.65\nsamples = 24
\nvalue = [20, 4]'),
```

```
 Text(423.883547731889, 165.25440000000003, 'X[4] <= 0.296\nentropy = 0.559\nsamples = 23
\nvalue = [20, 3]'),
 Text(422.7501692620176, 147.8592, 'entropy = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(425.0169262017603, 147.8592, 'X[4] <= 0.334\nentropy = 0.75\nsamples = 14\nvalue =
 [11, 3]'),
 Text(423.883547731889, 130.464, 'X[3] <= 0.571\nentropy = 0.954\nsamples = 8\nvalue = [5,
 3]'),
 Text(422.7501692620176, 113.06880000000001, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(425.0169262017603, 113.06880000000001, 'X[0] <= 0.51\nentropy = 1.0\nsamples = 6\nva
lue = [3, 3]'),
 Text(423.883547731889, 95.67360000000002, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(426.1503046716317, 95.67360000000002, 'X[2] <= 0.297\nentropy = 0.811\nsamples = 4\n
value = [3, 1]'),
 Text(425.0169262017603, 78.27840000000003, 'X[1] <= 0.678\nentropy = 1.0\nsamples = 2\nva
lue = [1, 1]'),
 Text(423.883547731889, 60.88319999999999, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(426.1503046716317, 60.88319999999999, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(427.28368314150305, 78.27840000000003, 'entropy = 0.0\nsamples = 2\nvalue = [2,
 0]'),
 Text(426.1503046716317, 130.464, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(426.1503046716317, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(416.5165876777251, 234.83520000000001, 'entropy = 0.0\nsamples = 8\nvalue = [8,
 0]'),
 Text(419.9167230873392, 252.2304, 'X[1] <= 0.654\nentropy = 0.845\nsamples = 11\nvalue =
 [3, 8]'),
 Text(418.7833446174679, 234.83520000000001, 'X[4] <= 0.303\nentropy = 0.811\nsamples = 4
\nvalue = [3, 1]'),
 Text(417.6499661475965, 217.44, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(419.9167230873392, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(421.0501015572106, 234.83520000000001, 'entropy = 0.0\nsamples = 7\nvalue = [0,
 7]'),
 Text(430.1171293161815, 269.62559999999996, 'X[1] <= 0.61\nentropy = 0.706\nsamples = 52
\nvalue = [42, 10]'),
 Text(425.0169262017603, 252.2304, 'X[0] <= 0.564\nentropy = 0.371\nsamples = 28\nvalue =
 [26, 2]'),
 Text(423.883547731889, 234.83520000000001, 'entropy = 0.0\nsamples = 15\nvalue = [15,
 0]'),
 Text(426.1503046716317, 234.83520000000001, 'X[0] <= 0.565\nentropy = 0.619\nsamples = 13
\nvalue = [11, 2]'),
 Text(425.0169262017603, 217.44, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(427.28368314150305, 217.44, 'X[1] <= 0.563\nentropy = 0.414\nsamples = 12\nvalue =
 [11, 1]'),
 Text(426.1503046716317, 200.0448, 'entropy = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(428.41706161137444, 200.0448, 'X[2] <= 0.508\nentropy = 0.811\nsamples = 4\nvalue =
 [3, 1]'),
 Text(427.28368314150305, 182.64960000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(429.55044008124577, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(435.2173324306026, 252.2304, 'X[3] <= 0.585\nentropy = 0.918\nsamples = 24\nvalue =
 [16, 8]'),
 Text(432.9505754908599, 234.83520000000001, 'X[3] <= 0.532\nentropy = 0.954\nsamples = 8
\nvalue = [3, 5]'),
 Text(431.8171970209885, 217.44, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(434.0839539607312, 217.44, 'X[1] <= 0.626\nentropy = 0.65\nsamples = 6\nvalue = [1,
 5]'),
 Text(432.9505754908599, 200.0448, 'X[4] <= 0.292\nentropy = 1.0\nsamples = 2\nvalue = [1,
 1]'),
 Text(431.8171970209885, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(434.0839539607312, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 Text(435.2173324306026, 200.0448, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(437.4840893703453, 234.83520000000001, 'X[1] <= 0.691\nentropy = 0.696\nsamples = 16
```


\nvalue = [13, 3]'),
Text(436.350710900474, 217.44, 'entropy = 0.0\nsamples = 10\nvalue = [10, 0]'),
Text(438.6174678402167, 217.44, 'X[4] <= 0.268\nentropy = 1.0\nsamples = 6\nvalue = [3, 3]'),
Text(437.4840893703453, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(439.75084631008804, 200.0448, 'X[0] <= 0.566\nentropy = 0.811\nsamples = 4\nvalue = [3, 1]'),
Text(438.6174678402167, 182.64960000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(440.8842247799594, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(468.08530805687207, 321.8112, 'X[3] <= 0.484\nentropy = 0.394\nsamples = 477\nvalue = [440, 37]'),
Text(455.33480027081924, 304.416, 'X[1] <= 0.638\nentropy = 0.697\nsamples = 117\nvalue = [95, 22]'),
Text(454.2014218009479, 287.0208, 'X[1] <= 0.465\nentropy = 0.553\nsamples = 109\nvalue = [95, 14]'),
Text(449.3845633039946, 269.62559999999996, 'X[3] <= 0.483\nentropy = 0.344\nsamples = 78\nvalue = [73, 5]'),
Text(448.25118483412325, 252.2304, 'X[4] <= 0.26\nentropy = 0.295\nsamples = 77\nvalue = [73, 4]'),
Text(447.11780636425186, 234.83520000000001, 'X[3] <= 0.329\nentropy = 0.605\nsamples = 27\nvalue = [23, 4]'),
Text(443.15098171970214, 217.44, 'X[2] <= 0.354\nentropy = 0.918\nsamples = 3\nvalue = [1, 2]'),
Text(442.01760324983076, 200.0448, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(444.2843601895735, 200.0448, 'X[3] <= 0.275\nentropy = 1.0\nsamples = 2\nvalue = [1, 1]'),
Text(443.15098171970214, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(445.41773865944486, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(451.08463100880164, 217.44, 'X[4] <= 0.15\nentropy = 0.414\nsamples = 24\nvalue = [22, 2]'),
Text(448.8178740690589, 200.0448, 'X[1] <= 0.368\nentropy = 1.0\nsamples = 2\nvalue = [1, 1]'),
Text(447.6844955991876, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(449.9512525389303, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(453.35138794854436, 200.0448, 'X[3] <= 0.477\nentropy = 0.267\nsamples = 22\nvalue = [21, 1]'),
Text(452.218009478673, 182.64960000000002, 'entropy = 0.0\nsamples = 19\nvalue = [19, 0]'),
Text(454.48476641841575, 182.64960000000002, 'X[0] <= 0.628\nentropy = 0.918\nsamples = 3\nvalue = [2, 1]'),
Text(453.35138794854436, 165.25440000000003, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(455.6181448882871, 165.25440000000003, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(449.3845633039946, 234.83520000000001, 'entropy = 0.0\nsamples = 50\nvalue = [50, 0]'),
Text(450.51794177386597, 252.2304, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(459.0182802979012, 269.62559999999996, 'X[1] <= 0.471\nentropy = 0.869\nsamples = 31\nvalue = [22, 9]'),
Text(457.8849018280298, 252.2304, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(460.1516587677725, 252.2304, 'X[3] <= 0.261\nentropy = 0.75\nsamples = 28\nvalue = [22, 6]'),
Text(459.0182802979012, 234.83520000000001, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(461.2850372376439, 234.83520000000001, 'X[2] <= 0.336\nentropy = 0.619\nsamples = 26\nvalue = [22, 4]'),
Text(459.0182802979012, 217.44, 'X[0] <= 0.728\nentropy = 1.0\nsamples = 6\nvalue = [3, 3]'),
Text(457.8849018280298, 200.0448, 'X[1] <= 0.483\nentropy = 0.811\nsamples = 4\nvalue = [3, 1]'),

```
 Text(456.75152335815847, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(459.0182802979012, 182.64960000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3,
 0]'),
 Text(460.1516587677725, 200.0448, 'entropy = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(463.5517941773866, 217.44, 'X[4] <= 0.225\nentropy = 0.286\nsamples = 20\nvalue = [1
9, 1]'),
 Text(462.41841570751524, 200.0448, 'X[3] <= 0.439\nentropy = 1.0\nsamples = 2\nvalue =
 [1, 1]'),
 Text(461.2850372376439, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
 1]'),
 Text(463.5517941773866, 182.64960000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
 0]'),
 ...]
```



In [144…]
```
dotfile = open("data/tree_entropy.dot", 'w')
tree.export_graphviz(clf4, out_file = dotfile, feature_names = xtrain.columns)
dotfile.close()
```

In [43]:
```
ypred4 = clf4.predict(xtest)
```

In [44]:
```
scores4 = cross_val_score(clf4, xtrain, ytrain, cv=5)
scores4
```

Out[44]:
```
array([0.8172043 , 0.80040323, 0.81586022, 0.83254876, 0.81909886])
```

In [45]:
```
print("%0.4f accuracy with a standard deviation of %0.4f" % (scores4.mean(), scores4.std()
```

```
0.8170 accuracy with a standard deviation of 0.0102
```

In [46]:
```
hyperparameters = hyperparameters.append({'hyperparameters':'entropy', 'accuracy': scores4
```

max_depth + entropy

Kombinácia hyperparametrov, kedy sa generovanie rozhodovacieho stromu ukončí po dosiahnutí hodnoty v max_depth a zároveň sa generujú nové elementy až pokiaľ nedosiahnu žiadnu "impurity" a stanú sa listami

stromu.

In [47]:
```
clf5 = tree.DecisionTreeClassifier(criterion='entropy', max_depth=8)
clf5 = clf5.fit(xtrain, ytrain)
plt.figure(figsize=(15,8))
tree.plot_tree(clf5)
```

Out[47]:
```
[Text(345.7193386130137, 410.71999999999997, 'X[0] <= 0.422\nentropy = 0.938\nsamples = 7438\nvalue = [2636, 4802]'),
 Text(152.18996147260273, 362.4, 'X[4] <= 0.343\nentropy = 0.513\nsamples = 2370\nvalue = [271, 2099]'),
 Text(87.60552226027397, 314.08, 'X[0] <= 0.404\nentropy = 0.301\nsamples = 1122\nvalue = [60, 1062]'),
 Text(57.68707191780822, 265.76, 'X[3] <= 0.617\nentropy = 0.259\nsamples = 1028\nvalue = [45, 983]'),
 Text(30.81421232876712, 217.44, 'X[1] <= 0.713\nentropy = 0.322\nsamples = 596\nvalue = [35, 561]'),
 Text(15.76541095890411, 169.12, 'X[3] <= 0.196\nentropy = 0.266\nsamples = 575\nvalue = [26, 549]'),
 Text(8.59931506849315, 120.80000000000001, 'X[3] <= 0.181\nentropy = 0.881\nsamples = 10\nvalue = [3, 7]'),
 Text(5.732876712328767, 72.48000000000002, 'X[2] <= 0.25\nentropy = 0.544\nsamples = 8\nvalue = [1, 7]'),
 Text(2.8664383561643834, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(8.59931506849315, 24.159999999999968, 'entropy = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(11.465753424657533, 72.48000000000002, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(22.931506849315067, 120.80000000000001, 'X[0] <= 0.306\nentropy = 0.246\nsamples = 565\nvalue = [23, 542]'),
 Text(17.1986301369863, 72.48000000000002, 'X[4] <= 0.169\nentropy = 0.09\nsamples = 264\nvalue = [3, 261]'),
 Text(14.332191780821917, 24.159999999999968, 'entropy = 0.619\nsamples = 13\nvalue = [2, 11]'),
 Text(20.065068493150683, 24.159999999999968, 'entropy = 0.037\nsamples = 251\nvalue = [1, 250]'),
 Text(28.664383561643834, 72.48000000000002, 'X[0] <= 0.307\nentropy = 0.353\nsamples = 301\nvalue = [20, 281]'),
 Text(25.79794520547945, 24.159999999999968, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(31.53082191780822, 24.159999999999968, 'entropy = 0.328\nsamples = 299\nvalue = [18, 281]'),
 Text(45.863013698630134, 169.12, 'X[4] <= 0.212\nentropy = 0.985\nsamples = 21\nvalue = [9, 12]'),
 Text(37.263698630136986, 120.80000000000001, 'X[1] <= 0.719\nentropy = 0.65\nsamples = 12\nvalue = [2, 10]'),
 Text(34.3972602739726, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(40.130136986301366, 72.48000000000002, 'X[3] <= 0.614\nentropy = 0.439\nsamples = 11\nvalue = [1, 10]'),
 Text(37.263698630136986, 24.159999999999968, 'entropy = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(42.99657534246575, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(54.46232876712328, 120.80000000000001, 'X[0] <= 0.382\nentropy = 0.764\nsamples = 9\nvalue = [7, 2]'),
 Text(51.5958904109589, 72.48000000000002, 'X[2] <= 0.335\nentropy = 0.544\nsamples = 8\nvalue = [7, 1]'),
 Text(48.729452054794514, 24.159999999999968, 'entropy = 1.0\nsamples = 2\nvalue = [1, 1]'),
 Text(54.46232876712328, 24.159999999999968, 'entropy = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(57.32876712328767, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(84.55993150684931, 217.44, 'X[1] <= 0.868\nentropy = 0.159\nsamples = 432\nvalue = [10, 422]'),
```

```
 Text(71.66095890410958, 169.12, 'X[3] <= 0.732\nentropy = 0.099\nsamples = 389\nvalue =
[5, 384]'),
 Text(65.92808219178082, 120.80000000000001, 'X[0] <= 0.365\nentropy = 0.037\nsamples = 25
2\nvalue = [1, 251]'),
 Text(63.06164383561644, 72.48000000000002, 'entropy = 0.0\nsamples = 213\nvalue = [0, 21
3]'),
 Text(68.7945205479452, 72.48000000000002, 'X[0] <= 0.367\nentropy = 0.172\nsamples = 39\n
value = [1, 38]'),
 Text(65.92808219178082, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(71.66095890410958, 24.159999999999968, 'entropy = 0.0\nsamples = 38\nvalue = [0, 3
8]'),
 Text(77.39383561643835, 120.80000000000001, 'X[3] <= 0.732\nentropy = 0.19\nsamples = 137
\nvalue = [4, 133]'),
 Text(74.52739726027397, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(80.26027397260273, 72.48000000000002, 'X[1] <= 0.771\nentropy = 0.153\nsamples = 136
\nvalue = [3, 133]'),
 Text(77.39383561643835, 24.159999999999968, 'entropy = 0.267\nsamples = 66\nvalue = [3, 6
3]'),
 Text(83.12671232876711, 24.159999999999968, 'entropy = 0.0\nsamples = 70\nvalue = [0, 7
0]'),
 Text(97.45890410958903, 169.12, 'X[2] <= 0.433\nentropy = 0.519\nsamples = 43\nvalue =
[5, 38]'),
 Text(94.59246575342465, 120.80000000000001, 'X[2] <= 0.422\nentropy = 0.811\nsamples = 20
\nvalue = [5, 15]'),
 Text(91.72602739726027, 72.48000000000002, 'X[3] <= 0.665\nentropy = 0.65\nsamples = 18\n
value = [3, 15]'),
 Text(88.85958904109589, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(94.59246575342465, 24.159999999999968, 'entropy = 0.523\nsamples = 17\nvalue = [2, 1
5]'),
 Text(97.45890410958903, 72.48000000000002, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(100.32534246575342, 120.80000000000001, 'entropy = 0.0\nsamples = 23\nvalue = [0, 2
3]'),
 Text(117.52397260273972, 265.76, 'X[1] <= 0.812\nentropy = 0.633\nsamples = 94\nvalue =
[15, 79]'),
 Text(111.79109589041096, 217.44, 'X[3] <= 0.558\nentropy = 0.556\nsamples = 85\nvalue =
[11, 74]'),
 Text(108.92465753424656, 169.12, 'X[1] <= 0.677\nentropy = 0.76\nsamples = 50\nvalue = [1
1, 39]'),
 Text(106.05821917808218, 120.80000000000001, 'X[2] <= 0.462\nentropy = 0.696\nsamples = 4
8\nvalue = [9, 39]'),
 Text(103.1917808219178, 72.48000000000002, 'entropy = 0.0\nsamples = 19\nvalue = [0, 1
9]'),
 Text(108.92465753424656, 72.48000000000002, 'X[2] <= 0.701\nentropy = 0.894\nsamples = 29
\nvalue = [9, 20]'),
 Text(106.05821917808218, 24.159999999999968, 'entropy = 0.954\nsamples = 24\nvalue = [9,
15]'),
 Text(111.79109589041096, 24.159999999999968, 'entropy = 0.0\nsamples = 5\nvalue = [0,
5]'),
 Text(111.79109589041096, 120.80000000000001, 'entropy = 0.0\nsamples = 2\nvalue = [2,
0]'),
 Text(114.65753424657534, 169.12, 'entropy = 0.0\nsamples = 35\nvalue = [0, 35]'),
 Text(123.25684931506848, 217.44, 'X[3] <= 0.812\nentropy = 0.991\nsamples = 9\nvalue =
[4, 5]'),
 Text(120.3904109589041, 169.12, 'entropy = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(126.12328767123287, 169.12, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(216.7744006849315, 314.08, 'X[0] <= 0.374\nentropy = 0.656\nsamples = 1248\nvalue =
[211, 1037]'),
 Text(160.87885273972603, 265.76, 'X[1] <= 0.334\nentropy = 0.524\nsamples = 888\nvalue =
[105, 783]'),
 Text(137.5890410958904, 217.44, 'X[0] <= 0.33\nentropy = 0.197\nsamples = 196\nvalue =
[6, 190]'),
 Text(131.85616438356163, 169.12, 'X[4] <= 0.627\nentropy = 0.062\nsamples = 139\nvalue =
[1, 138]'),
 Text(128.98972602739724, 120.80000000000001, 'entropy = 0.0\nsamples = 132\nvalue = [0, 1
```

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32]'),
 Text(134.72260273972603, 120.80000000000001, 'X[4] <= 0.63\nentropy = 0.592\nsamples = 7
\nvalue = [1, 6]'),
 Text(131.85616438356163, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(137.5890410958904, 72.48000000000002, 'entropy = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(143.32191780821915, 169.12, 'X[0] <= 0.331\nentropy = 0.429\nsamples = 57\nvalue =
[5, 52]'),
 Text(140.4554794520548, 120.80000000000001, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(146.18835616438355, 120.80000000000001, 'X[3] <= 0.473\nentropy = 0.371\nsamples = 5
6\nvalue = [4, 52]'),
 Text(143.32191780821915, 72.48000000000002, 'X[3] <= 0.191\nentropy = 0.305\nsamples = 55
\nvalue = [3, 52]'),
 Text(140.4554794520548, 24.159999999999968, 'entropy = 0.559\nsamples = 23\nvalue = [3, 2
0]'),
 Text(146.18835616438355, 24.159999999999968, 'entropy = 0.0\nsamples = 32\nvalue = [0, 3
2]'),
 Text(149.05479452054794, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(184.16866438356163, 217.44, 'X[3] <= 0.301\nentropy = 0.592\nsamples = 692\nvalue =
[99, 593]'),
 Text(167.68664383561642, 169.12, 'X[4] <= 0.567\nentropy = 0.999\nsamples = 69\nvalue =
[36, 33]'),
 Text(160.52054794520546, 120.80000000000001, 'X[1] <= 0.389\nentropy = 0.936\nsamples = 5
4\nvalue = [35, 19]'),
 Text(154.7876712328767, 72.48000000000002, 'X[3] <= 0.225\nentropy = 0.831\nsamples = 19
\nvalue = [5, 14]'),
 Text(151.9212328767123, 24.159999999999968, 'entropy = 0.0\nsamples = 5\nvalue = [5,
0]'),
 Text(157.6541095890411, 24.159999999999968, 'entropy = 0.0\nsamples = 14\nvalue = [0, 1
4]'),
 Text(166.25342465753423, 72.48000000000002, 'X[1] <= 0.814\nentropy = 0.592\nsamples = 35
\nvalue = [30, 5]'),
 Text(163.38698630136986, 24.159999999999968, 'entropy = 0.439\nsamples = 33\nvalue = [30,
3]'),
 Text(169.11986301369862, 24.159999999999968, 'entropy = 0.0\nsamples = 2\nvalue = [0,
2]'),
 Text(174.85273972602738, 120.80000000000001, 'X[4] <= 0.816\nentropy = 0.353\nsamples = 1
5\nvalue = [1, 14]'),
 Text(171.986301369863, 72.48000000000002, 'entropy = 0.0\nsamples = 14\nvalue = [0, 1
4]'),
 Text(177.71917808219177, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(200.65068493150685, 169.12, 'X[1] <= 0.671\nentropy = 0.473\nsamples = 623\nvalue =
[63, 560]'),
 Text(189.1849315068493, 120.80000000000001, 'X[4] <= 0.421\nentropy = 0.411\nsamples = 54
6\nvalue = [45, 501]'),
 Text(183.45205479452054, 72.48000000000002, 'X[3] <= 0.547\nentropy = 0.207\nsamples = 27
7\nvalue = [9, 268]'),
 Text(180.58561643835614, 24.159999999999968, 'entropy = 0.296\nsamples = 172\nvalue = [9,
163]'),
 Text(186.31849315068493, 24.159999999999968, 'entropy = 0.0\nsamples = 105\nvalue = [0, 1
05]'),
 Text(194.91780821917806, 72.48000000000002, 'X[0] <= 0.227\nentropy = 0.568\nsamples = 26
9\nvalue = [36, 233]'),
 Text(192.0513698630137, 24.159999999999968, 'entropy = 0.0\nsamples = 48\nvalue = [0, 4
8]'),
 Text(197.78424657534245, 24.159999999999968, 'entropy = 0.641\nsamples = 221\nvalue = [3
6, 185]'),
 Text(212.11643835616437, 120.80000000000001, 'X[4] <= 0.564\nentropy = 0.785\nsamples = 7
7\nvalue = [18, 59]'),
 Text(206.3835616438356, 72.48000000000002, 'X[3] <= 0.667\nentropy = 0.946\nsamples = 44
\nvalue = [16, 28]'),
 Text(203.5171232876712, 24.159999999999968, 'entropy = 0.932\nsamples = 23\nvalue = [15,
8]'),
```

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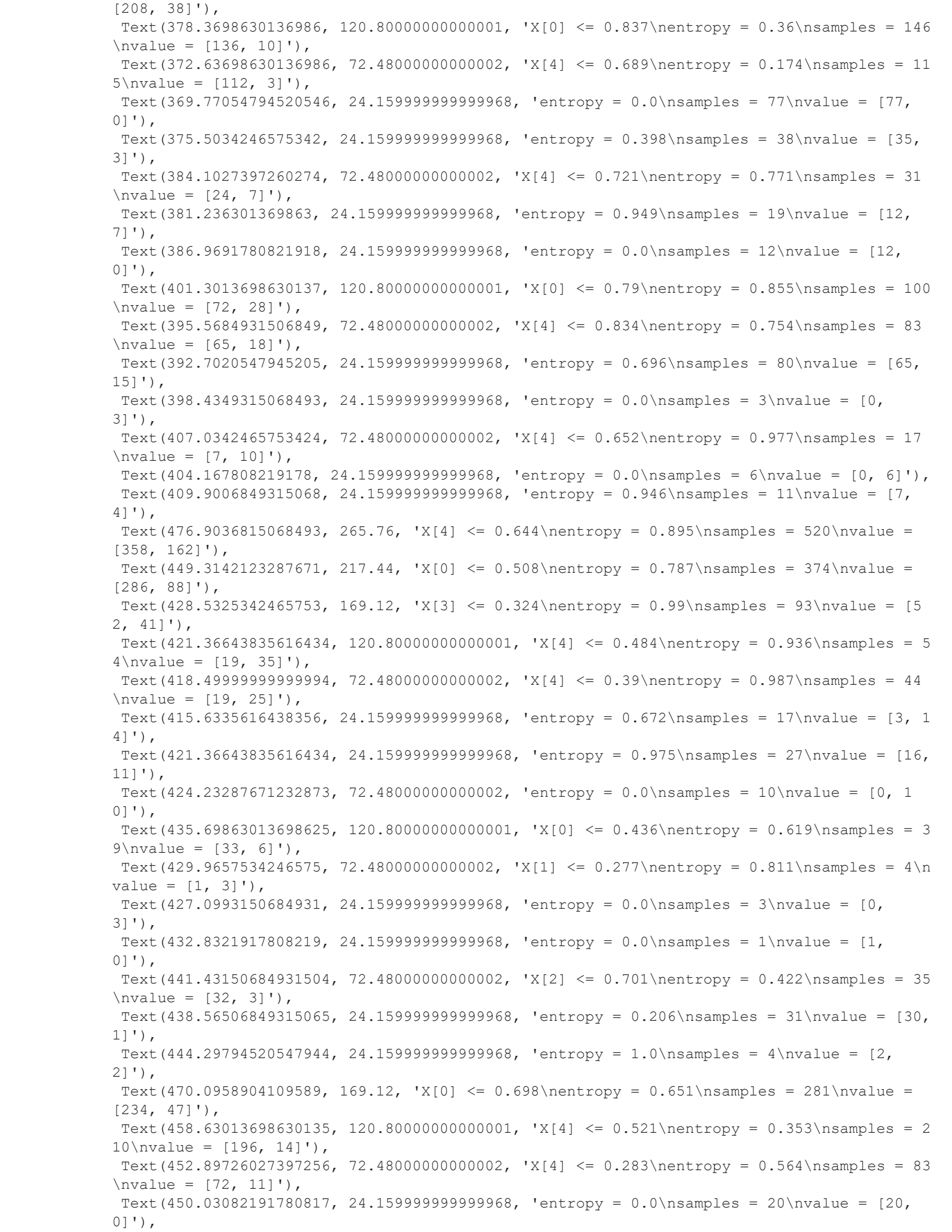
 Text(209.24999999999997, 24.159999999999968, 'entropy = 0.276\nsamples = 21\nvalue = [1,
20]'),
 Text(217.84931506849313, 72.48000000000002, 'X[0] <= 0.253\nentropy = 0.33\nsamples = 33
\nvalue = [2, 31]'),
 Text(214.98287671232876, 24.159999999999968, 'entropy = 0.971\nsamples = 5\nvalue = [2,
3]'),
 Text(220.71575342465752, 24.159999999999968, 'entropy = 0.0\nsamples = 28\nvalue = [0, 2
8]'),
 Text(272.66994863013696, 265.76, 'X[4] <= 0.621\nentropy = 0.874\nsamples = 360\nvalue =
[106, 254]'),
 Text(247.23030821917806, 217.44, 'X[1] <= 0.286\nentropy = 0.931\nsamples = 291\nvalue =
[101, 190]'),
 Text(232.18150684931504, 169.12, 'X[3] <= 0.327\nentropy = 0.527\nsamples = 42\nvalue =
[5, 37]'),
 Text(226.44863013698628, 120.80000000000001, 'X[0] <= 0.417\nentropy = 0.191\nsamples = 3
4\nvalue = [1, 33]'),
 Text(223.58219178082192, 72.48000000000002, 'entropy = 0.0\nsamples = 33\nvalue = [0, 3
3]'),
 Text(229.31506849315068, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(237.91438356164383, 120.80000000000001, 'X[4] <= 0.445\nentropy = 1.0\nsamples = 8\n
value = [4, 4]'),
 Text(235.04794520547944, 72.48000000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3,
0]'),
 Text(240.7808219178082, 72.48000000000002, 'X[3] <= 0.696\nentropy = 0.722\nsamples = 5\n
value = [1, 4]'),
 Text(237.91438356164383, 24.159999999999968, 'entropy = 0.0\nsamples = 4\nvalue = [0,
4]'),
 Text(243.6472602739726, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(262.27910958904107, 169.12, 'X[3] <= 0.236\nentropy = 0.962\nsamples = 249\nvalue =
[96, 153]'),
 Text(255.1130136986301, 120.80000000000001, 'X[1] <= 0.676\nentropy = 0.779\nsamples = 26
\nvalue = [20, 6]'),
 Text(252.24657534246575, 72.48000000000002, 'X[2] <= 0.424\nentropy = 0.276\nsamples = 21
\nvalue = [20, 1]'),
 Text(249.38013698630135, 24.159999999999968, 'entropy = 0.918\nsamples = 3\nvalue = [2,
1]'),
 Text(255.1130136986301, 24.159999999999968, 'entropy = 0.0\nsamples = 18\nvalue = [18,
0]'),
 Text(257.9794520547945, 72.48000000000002, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(269.44520547945206, 120.80000000000001, 'X[4] <= 0.46\nentropy = 0.926\nsamples = 22
3\nvalue = [76, 147]'),
 Text(263.71232876712327, 72.48000000000002, 'X[1] <= 0.601\nentropy = 0.808\nsamples = 13
7\nvalue = [34, 103]'),
 Text(260.8458904109589, 24.159999999999968, 'entropy = 0.628\nsamples = 108\nvalue = [17,
91]'),
 Text(266.57876712328766, 24.159999999999968, 'entropy = 0.978\nsamples = 29\nvalue = [17,
12]'),
 Text(275.1780821917808, 72.48000000000002, 'X[1] <= 0.7\nentropy = 1.0\nsamples = 86\nval
ue = [42, 44]'),
 Text(272.3116438356164, 24.159999999999968, 'entropy = 0.983\nsamples = 59\nvalue = [34,
25]'),
 Text(278.0445205479452, 24.159999999999968, 'entropy = 0.877\nsamples = 27\nvalue = [8, 1
9]'),
 Text(298.1095890410959, 217.44, 'X[4] <= 0.694\nentropy = 0.375\nsamples = 69\nvalue =
[5, 64]'),
 Text(295.2431506849315, 169.12, 'X[0] <= 0.407\nentropy = 0.581\nsamples = 36\nvalue =
[5, 31]'),
 Text(289.5102739726027, 120.80000000000001, 'X[0] <= 0.381\nentropy = 0.235\nsamples = 26
\nvalue = [1, 25]'),
 Text(286.6438356164383, 72.48000000000002, 'X[1] <= 0.634\nentropy = 1.0\nsamples = 2\nva
lue = [1, 1]'),
 Text(283.777397260274, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(289.5102739726027, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
```

```
 Text(292.3767123287671, 72.48000000000002, 'entropy = 0.0\nsamples = 24\nvalue = [0, 2
4]'),
 Text(300.9760273972602, 120.80000000000001, 'X[1] <= 0.629\nentropy = 0.971\nsamples = 10
\nvalue = [4, 6]'),
 Text(298.1095890410959, 72.48000000000002, 'X[2] <= 0.725\nentropy = 0.722\nsamples = 5\n
value = [4, 1]'),
 Text(295.2431506849315, 24.159999999999968, 'entropy = 0.0\nsamples = 4\nvalue = [4,
0]'),
 Text(300.9760273972602, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(303.8424657534246, 72.48000000000002, 'entropy = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(300.9760273972602, 169.12, 'entropy = 0.0\nsamples = 33\nvalue = [0, 33]'),
 Text(539.2487157534247, 362.4, 'X[1] <= 0.288\nentropy = 0.997\nsamples = 5068\nvalue =
[2365, 2703]'),
 Text(413.1254280821918, 314.08, 'X[1] <= 0.206\nentropy = 0.707\nsamples = 1199\nvalue =
[968, 231]'),
 Text(349.3471746575342, 265.76, 'X[0] <= 0.528\nentropy = 0.474\nsamples = 679\nvalue =
[610, 69]'),
 Text(325.3407534246575, 217.44, 'X[4] <= 0.499\nentropy = 0.956\nsamples = 53\nvalue = [3
3, 20]'),
 Text(318.17465753424653, 169.12, 'X[3] <= 0.157\nentropy = 0.592\nsamples = 35\nvalue =
[30, 5]'),
 Text(312.4417808219178, 120.80000000000001, 'X[3] <= 0.083\nentropy = 0.722\nsamples = 5
\nvalue = [1, 4]'),
 Text(309.5753424657534, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(315.3082191780822, 72.48000000000002, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(323.9075342465753, 120.80000000000001, 'X[2] <= 0.174\nentropy = 0.211\nsamples = 30
\nvalue = [29, 1]'),
 Text(321.04109589041093, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(326.7739726027397, 72.48000000000002, 'entropy = 0.0\nsamples = 29\nvalue = [29,
0]'),
 Text(332.50684931506845, 169.12, 'X[3] <= 0.413\nentropy = 0.65\nsamples = 18\nvalue =
[3, 15]'),
 Text(329.6404109589041, 120.80000000000001, 'entropy = 0.0\nsamples = 14\nvalue = [0, 1
4]'),
 Text(335.37328767123284, 120.80000000000001, 'X[4] <= 0.704\nentropy = 0.811\nsamples = 4
\nvalue = [3, 1]'),
 Text(332.50684931506845, 72.48000000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3,
0]'),
 Text(338.23972602739724, 72.48000000000002, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(373.35359589041093, 217.44, 'X[4] <= 0.624\nentropy = 0.396\nsamples = 626\nvalue =
[577, 49]'),
 Text(356.87157534246575, 169.12, 'X[0] <= 0.914\nentropy = 0.189\nsamples = 380\nvalue =
[369, 11]'),
 Text(349.70547945205476, 120.80000000000001, 'X[3] <= 0.238\nentropy = 0.149\nsamples = 3
74\nvalue = [366, 8]'),
 Text(343.972602739726, 72.48000000000002, 'X[1] <= 0.2\nentropy = 0.383\nsamples = 67\nva
lue = [62, 5]'),
 Text(341.10616438356163, 24.159999999999968, 'entropy = 0.33\nsamples = 66\nvalue = [62,
4]'),
 Text(346.83904109589037, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(355.43835616438355, 72.48000000000002, 'X[0] <= 0.805\nentropy = 0.079\nsamples = 30
7\nvalue = [304, 3]'),
 Text(352.57191780821915, 24.159999999999968, 'entropy = 0.033\nsamples = 288\nvalue = [28
7, 1]'),
 Text(358.30479452054794, 24.159999999999968, 'entropy = 0.485\nsamples = 19\nvalue = [17,
2]'),
 Text(364.0376712328767, 120.80000000000001, 'X[3] <= 0.568\nentropy = 1.0\nsamples = 6\nv
alue = [3, 3]'),
 Text(361.1712328767123, 72.48000000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(366.90410958904107, 72.48000000000002, 'entropy = 0.0\nsamples = 3\nvalue = [0,
3]'),
 Text(389.8356164383561, 169.12, 'X[1] <= 0.147\nentropy = 0.621\nsamples = 246\nvalue =
```


[208, 38]'),
Text(378.3698630136986, 120.80000000000001, 'X[0] <= 0.837\nentropy = 0.36\nsamples = 146\nvalue = [136, 10]'),
Text(372.63698630136986, 72.48000000000002, 'X[4] <= 0.689\nentropy = 0.174\nsamples = 115\nvalue = [112, 3]'),
Text(369.77054794520546, 24.159999999999968, 'entropy = 0.0\nsamples = 77\nvalue = [77, 0]'),
Text(375.5034246575342, 24.159999999999968, 'entropy = 0.398\nsamples = 38\nvalue = [35, 3]'),
Text(384.1027397260274, 72.48000000000002, 'X[4] <= 0.721\nentropy = 0.771\nsamples = 31\nvalue = [24, 7]'),
Text(381.236301369863, 24.159999999999968, 'entropy = 0.949\nsamples = 19\nvalue = [12, 7]'),
Text(386.9691780821918, 24.159999999999968, 'entropy = 0.0\nsamples = 12\nvalue = [12, 0]'),
Text(401.3013698630137, 120.80000000000001, 'X[0] <= 0.79\nentropy = 0.855\nsamples = 100\nvalue = [72, 28]'),
Text(395.5684931506849, 72.48000000000002, 'X[4] <= 0.834\nentropy = 0.754\nsamples = 83\nvalue = [65, 18]'),
Text(392.7020547945205, 24.159999999999968, 'entropy = 0.696\nsamples = 80\nvalue = [65, 15]'),
Text(398.4349315068493, 24.159999999999968, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(407.0342465753424, 72.48000000000002, 'X[4] <= 0.652\nentropy = 0.977\nsamples = 17\nvalue = [7, 10]'),
Text(404.167808219178, 24.159999999999968, 'entropy = 0.0\nsamples = 6\nvalue = [0, 6]'),
Text(409.9006849315068, 24.159999999999968, 'entropy = 0.946\nsamples = 11\nvalue = [7, 4]'),
Text(476.9036815068493, 265.76, 'X[4] <= 0.644\nentropy = 0.895\nsamples = 520\nvalue = [358, 162]'),
Text(449.3142123287671, 217.44, 'X[0] <= 0.508\nentropy = 0.787\nsamples = 374\nvalue = [286, 88]'),
Text(428.5325342465753, 169.12, 'X[3] <= 0.324\nentropy = 0.99\nsamples = 93\nvalue = [52, 41]'),
Text(421.36643835616434, 120.80000000000001, 'X[4] <= 0.484\nentropy = 0.936\nsamples = 54\nvalue = [19, 35]'),
Text(418.49999999999994, 72.48000000000002, 'X[4] <= 0.39\nentropy = 0.987\nsamples = 44\nvalue = [19, 25]'),
Text(415.6335616438356, 24.159999999999968, 'entropy = 0.672\nsamples = 17\nvalue = [3, 14]'),
Text(421.36643835616434, 24.159999999999968, 'entropy = 0.975\nsamples = 27\nvalue = [16, 11]'),
Text(424.23287671232873, 72.48000000000002, 'entropy = 0.0\nsamples = 10\nvalue = [0, 10]'),
Text(435.69863013698625, 120.80000000000001, 'X[0] <= 0.436\nentropy = 0.619\nsamples = 39\nvalue = [33, 6]'),
Text(429.9657534246575, 72.48000000000002, 'X[1] <= 0.277\nentropy = 0.811\nsamples = 4\nvalue = [1, 3]'),
Text(427.0993150684931, 24.159999999999968, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(432.8321917808219, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(441.43150684931504, 72.48000000000002, 'X[2] <= 0.701\nentropy = 0.422\nsamples = 35\nvalue = [32, 3]'),
Text(438.56506849315065, 24.159999999999968, 'entropy = 0.206\nsamples = 31\nvalue = [30, 1]'),
Text(444.29794520547944, 24.159999999999968, 'entropy = 1.0\nsamples = 4\nvalue = [2, 2]'),
Text(470.0958904109589, 169.12, 'X[0] <= 0.698\nentropy = 0.651\nsamples = 281\nvalue = [234, 47]'),
Text(458.63013698630135, 120.80000000000001, 'X[4] <= 0.521\nentropy = 0.353\nsamples = 210\nvalue = [196, 14]'),
Text(452.89726027397256, 72.48000000000002, 'X[4] <= 0.283\nentropy = 0.564\nsamples = 83\nvalue = [72, 11]'),
Text(450.03082191780817, 24.159999999999968, 'entropy = 0.0\nsamples = 20\nvalue = [20, 0]'),

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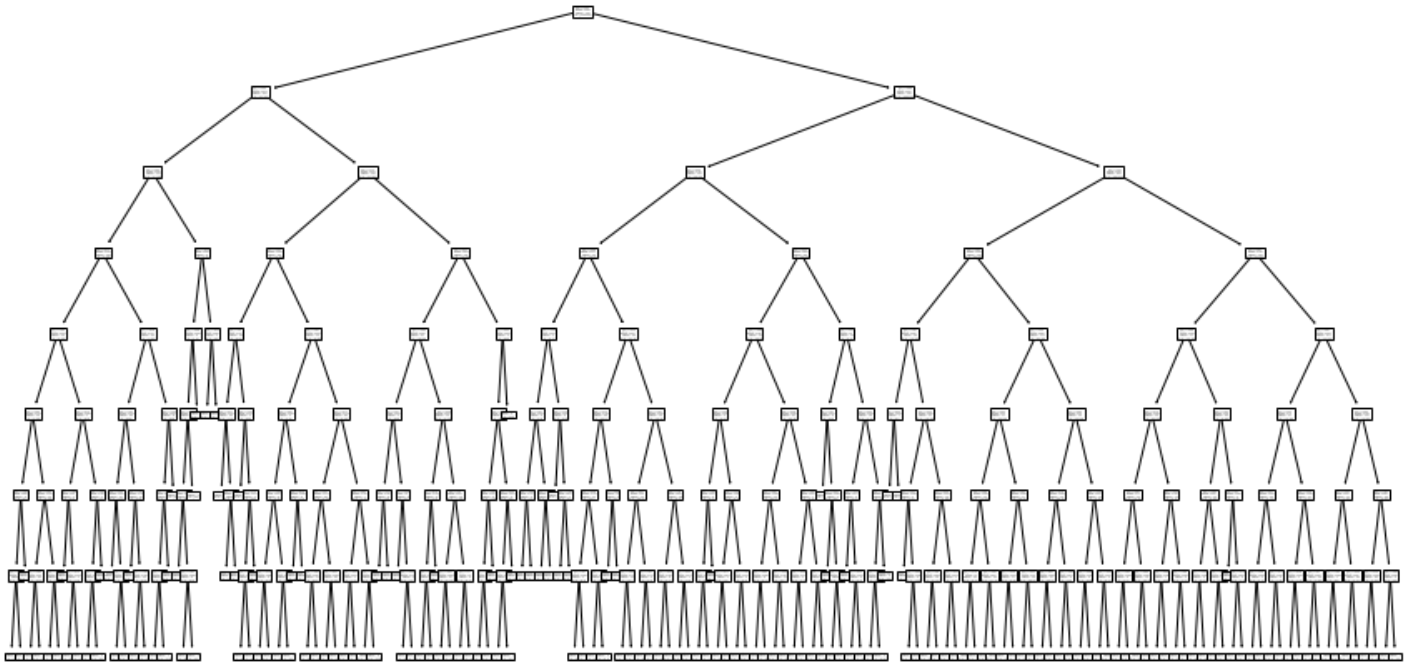
 Text(455.76369863013696, 24.159999999999968, 'entropy = 0.668\nsamples = 63\nvalue = [52,
11]'),
 Text(464.3630136986301, 72.48000000000002, 'X[1] <= 0.263\nentropy = 0.161\nsamples = 127
\nvalue = [124, 3]'),
 Text(461.49657534246575, 24.159999999999968, 'entropy = 0.0\nsamples = 88\nvalue = [88,
0]'),
 Text(467.2294520547945, 24.159999999999968, 'entropy = 0.391\nsamples = 39\nvalue = [36,
3]'),
 Text(481.5616438356164, 120.80000000000001, 'X[4] <= 0.517\nentropy = 0.996\nsamples = 71
\nvalue = [38, 33]'),
 Text(475.82876712328766, 72.48000000000002, 'X[0] <= 0.828\nentropy = 0.477\nsamples = 39
\nvalue = [35, 4]'),
 Text(472.96232876712327, 24.159999999999968, 'entropy = 0.0\nsamples = 24\nvalue = [24,
0]'),
 Text(478.695205479452, 24.159999999999968, 'entropy = 0.837\nsamples = 15\nvalue = [11,
4]'),
 Text(487.2945205479452, 72.48000000000002, 'X[3] <= 0.295\nentropy = 0.449\nsamples = 32
\nvalue = [3, 29]'),
 Text(484.4280821917808, 24.159999999999968, 'entropy = 0.0\nsamples = 3\nvalue = [3,
0]'),
 Text(490.1609589041096, 24.159999999999968, 'entropy = 0.0\nsamples = 29\nvalue = [0, 2
9]'),
 Text(504.4931506849315, 217.44, 'X[3] <= 0.491\nentropy = 1.0\nsamples = 146\nvalue = [7
2, 74]'),
 Text(493.0273972602739, 169.12, 'X[0] <= 0.721\nentropy = 0.592\nsamples = 28\nvalue =
[4, 24]'),
 Text(490.1609589041096, 120.80000000000001, 'entropy = 0.0\nsamples = 19\nvalue = [0, 1
9]'),
 Text(495.8938356164383, 120.80000000000001, 'X[1] <= 0.261\nentropy = 0.991\nsamples = 9
\nvalue = [4, 5]'),
 Text(493.0273972602739, 72.48000000000002, 'entropy = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(498.7602739726027, 72.48000000000002, 'X[3] <= 0.331\nentropy = 0.863\nsamples = 7\n
value = [2, 5]'),
 Text(495.8938356164383, 24.159999999999968, 'entropy = 0.0\nsamples = 1\nvalue = [1,
0]'),
 Text(501.6267123287671, 24.159999999999968, 'entropy = 0.65\nsamples = 6\nvalue = [1,
5]'),
 Text(515.958904109589, 169.12, 'X[3] <= 0.603\nentropy = 0.983\nsamples = 118\nvalue = [6
8, 50]'),
 Text(507.35958904109583, 120.80000000000001, 'X[0] <= 0.662\nentropy = 0.977\nsamples = 3
4\nvalue = [14, 20]'),
 Text(504.4931506849315, 72.48000000000002, 'entropy = 0.0\nsamples = 11\nvalue = [0, 1
1]'),
 Text(510.2260273972602, 72.48000000000002, 'X[2] <= 0.644\nentropy = 0.966\nsamples = 23
\nvalue = [14, 9]'),
 Text(507.35958904109583, 24.159999999999968, 'entropy = 0.993\nsamples = 20\nvalue = [11,
9]'),
 Text(513.0924657534247, 24.159999999999968, 'entropy = 0.0\nsamples = 3\nvalue = [3,
0]'),
 Text(524.5582191780821, 120.80000000000001, 'X[0] <= 0.825\nentropy = 0.94\nsamples = 84
\nvalue = [54, 30]'),
 Text(521.6917808219177, 72.48000000000002, 'X[3] <= 0.626\nentropy = 0.918\nsamples = 81
\nvalue = [54, 27]'),
 Text(518.8253424657534, 24.159999999999968, 'entropy = 0.0\nsamples = 5\nvalue = [5,
0]'),
 Text(524.5582191780821, 24.159999999999968, 'entropy = 0.939\nsamples = 76\nvalue = [49,
27]'),
 Text(527.4246575342465, 72.48000000000002, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(665.3720034246575, 314.08, 'X[4] <= 0.447\nentropy = 0.944\nsamples = 3869\nvalue =
[1397, 2472]'),
 Text(580.8120719178082, 265.76, 'X[0] <= 0.485\nentropy = 0.948\nsamples = 1451\nvalue =
[920, 531]'),
 Text(542.4734589041095, 217.44, 'X[3] <= 0.197\nentropy = 0.901\nsamples = 338\nvalue =
[107, 231]'),
 Text(533.1575342465753, 169.12, 'X[2] <= 0.896\nentropy = 0.592\nsamples = 7\nvalue = [6,
1]'),
```

```
 Text(530.2910958904109, 120.80000000000001, 'entropy = 0.0\nsamples = 6\nvalue = [6,
0]'),
 Text(536.0239726027397, 120.80000000000001, 'entropy = 0.0\nsamples = 1\nvalue = [0,
1]'),
 Text(551.7893835616438, 169.12, 'X[4] <= 0.234\nentropy = 0.887\nsamples = 331\nvalue =
[101, 230]'),
 Text(541.7568493150685, 120.80000000000001, 'X[1] <= 0.421\nentropy = 0.644\nsamples = 61
\nvalue = [10, 51]'),
 Text(538.8904109589041, 72.48000000000002, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(544.6232876712328, 72.48000000000002, 'X[3] <= 0.559\nentropy = 0.531\nsamples = 58
\nvalue = [7, 51]'),
 Text(541.7568493150685, 24.159999999999968, 'entropy = 0.0\nsamples = 23\nvalue = [0, 2
3]'),
 Text(547.4897260273972, 24.159999999999968, 'entropy = 0.722\nsamples = 35\nvalue = [7, 2
8]'),
 Text(561.8219178082192, 120.80000000000001, 'X[1] <= 0.653\nentropy = 0.922\nsamples = 27
0\nvalue = [91, 179]'),
 Text(556.0890410958904, 72.48000000000002, 'X[3] <= 0.55\nentropy = 0.868\nsamples = 228
\nvalue = [66, 162]'),
 Text(553.222602739726, 24.159999999999968, 'entropy = 0.924\nsamples = 168\nvalue = [57,
111]'),
 Text(558.9554794520548, 24.159999999999968, 'entropy = 0.61\nsamples = 60\nvalue = [9, 5
1]'),
 Text(567.554794520548, 72.48000000000002, 'X[3] <= 0.621\nentropy = 0.974\nsamples = 42\n
value = [25, 17]'),
 Text(564.6883561643835, 24.159999999999968, 'entropy = 0.684\nsamples = 22\nvalue = [18,
4]'),
 Text(570.4212328767123, 24.159999999999968, 'entropy = 0.934\nsamples = 20\nvalue = [7, 1
3]'),
 Text(619.1506849315068, 217.44, 'X[4] <= 0.369\nentropy = 0.841\nsamples = 1113\nvalue =
[813, 300]'),
 Text(596.2191780821918, 169.12, 'X[0] <= 0.583\nentropy = 0.69\nsamples = 747\nvalue = [6
09, 138]'),
 Text(584.7534246575342, 120.80000000000001, 'X[3] <= 0.488\nentropy = 0.954\nsamples = 27
0\nvalue = [169, 101]'),
 Text(579.0205479452054, 72.48000000000002, 'X[2] <= 0.479\nentropy = 1.0\nsamples = 104\n
value = [52, 52]'),
 Text(576.154109589041, 24.159999999999968, 'entropy = 0.926\nsamples = 41\nvalue = [14, 2
7]'),
 Text(581.8869863013698, 24.159999999999968, 'entropy = 0.969\nsamples = 63\nvalue = [38,
25]'),
 Text(590.486301369863, 72.48000000000002, 'X[3] <= 0.501\nentropy = 0.875\nsamples = 166
\nvalue = [117, 49]'),
 Text(587.6198630136986, 24.159999999999968, 'entropy = 0.0\nsamples = 11\nvalue = [11,
0]'),
 Text(593.3527397260274, 24.159999999999968, 'entropy = 0.9\nsamples = 155\nvalue = [106,
49]'),
 Text(607.6849315068492, 120.80000000000001, 'X[3] <= 0.484\nentropy = 0.394\nsamples = 47
7\nvalue = [440, 37]'),
 Text(601.9520547945204, 72.48000000000002, 'X[1] <= 0.638\nentropy = 0.697\nsamples = 117
\nvalue = [95, 22]'),
 Text(599.0856164383562, 24.159999999999968, 'entropy = 0.553\nsamples = 109\nvalue = [95,
14]'),
 Text(604.8184931506848, 24.159999999999968, 'entropy = 0.0\nsamples = 8\nvalue = [0,
8]'),
 Text(613.417808219178, 72.48000000000002, 'X[2] <= 0.634\nentropy = 0.25\nsamples = 360\n
value = [345, 15]'),
 Text(610.5513698630136, 24.159999999999968, 'entropy = 0.154\nsamples = 270\nvalue = [26
4, 6]'),
 Text(616.2842465753424, 24.159999999999968, 'entropy = 0.469\nsamples = 90\nvalue = [81,
9]'),
 Text(642.0821917808219, 169.12, 'X[1] <= 0.573\nentropy = 0.99\nsamples = 366\nvalue = [2
04, 162]'),
 Text(630.6164383561644, 120.80000000000001, 'X[3] <= 0.619\nentropy = 0.923\nsamples = 22
5\nvalue = [149, 76]'),
 Text(624.8835616438356, 72.48000000000002, 'X[0] <= 0.807\nentropy = 0.854\nsamples = 197
```

```
\nvalue = [142, 55]'),
 Text(622.0171232876712, 24.159999999999968, 'entropy = 0.791\nsamples = 177\nvalue = [13
5, 42]'),
 Text(627.75, 24.159999999999968, 'entropy = 0.934\nsamples = 20\nvalue = [7, 13]'),
 Text(636.3493150684931, 72.48000000000002, 'X[2] <= 0.539\nentropy = 0.811\nsamples = 28
\nvalue = [7, 21]'),
 Text(633.4828767123287, 24.159999999999968, 'entropy = 0.337\nsamples = 16\nvalue = [1, 1
5]'),
 Text(639.2157534246575, 24.159999999999968, 'entropy = 1.0\nsamples = 12\nvalue = [6,
6]'),
 Text(653.5479452054794, 120.80000000000001, 'X[3] <= 0.394\nentropy = 0.965\nsamples = 14
1\nvalue = [55, 86]'),
 Text(647.8150684931506, 72.48000000000002, 'X[0] <= 0.588\nentropy = 0.365\nsamples = 43
\nvalue = [3, 40]'),
 Text(644.9486301369863, 24.159999999999968, 'entropy = 0.779\nsamples = 13\nvalue = [3, 1
0]'),
 Text(650.681506849315, 24.159999999999968, 'entropy = 0.0\nsamples = 30\nvalue = [0, 3
0]'),
 Text(659.2808219178082, 72.48000000000002, 'X[0] <= 0.602\nentropy = 0.997\nsamples = 98
\nvalue = [52, 46]'),
 Text(656.4143835616438, 24.159999999999968, 'entropy = 0.876\nsamples = 44\nvalue = [31,
13]'),
 Text(662.1472602739725, 24.159999999999968, 'entropy = 0.964\nsamples = 54\nvalue = [21,
33]'),
 Text(749.9319349315068, 265.76, 'X[1] <= 0.401\nentropy = 0.716\nsamples = 2418\nvalue =
[477, 1941]'),
 Text(708.7268835616438, 217.44, 'X[0] <= 0.598\nentropy = 0.941\nsamples = 741\nvalue =
[265, 476]'),
 Text(687.945205479452, 169.12, 'X[4] <= 0.672\nentropy = 0.985\nsamples = 335\nvalue = [1
92, 143]'),
 Text(676.4794520547945, 120.80000000000001, 'X[4] <= 0.501\nentropy = 0.77\nsamples = 213
\nvalue = [165, 48]'),
 Text(670.7465753424657, 72.48000000000002, 'X[3] <= 0.384\nentropy = 0.998\nsamples = 38
\nvalue = [20, 18]'),
 Text(667.8801369863013, 24.159999999999968, 'entropy = 0.863\nsamples = 28\nvalue = [20,
8]'),
 Text(673.6130136986301, 24.159999999999968, 'entropy = 0.0\nsamples = 10\nvalue = [0, 1
0]'),
 Text(682.2123287671233, 72.48000000000002, 'X[0] <= 0.586\nentropy = 0.661\nsamples = 175
\nvalue = [145, 30]'),
 Text(679.3458904109589, 24.159999999999968, 'entropy = 0.548\nsamples = 158\nvalue = [13
8, 20]'),
 Text(685.0787671232877, 24.159999999999968, 'entropy = 0.977\nsamples = 17\nvalue = [7, 1
0]'),
 Text(699.4109589041095, 120.80000000000001, 'X[3] <= 0.662\nentropy = 0.763\nsamples = 12
2\nvalue = [27, 95]'),
 Text(693.6780821917807, 72.48000000000002, 'X[0] <= 0.528\nentropy = 0.253\nsamples = 71
\nvalue = [3, 68]'),
 Text(690.8116438356163, 24.159999999999968, 'entropy = 0.516\nsamples = 26\nvalue = [3, 2
3]'),
 Text(696.5445205479451, 24.159999999999968, 'entropy = 0.0\nsamples = 45\nvalue = [0, 4
5]'),
 Text(705.1438356164383, 72.48000000000002, 'X[4] <= 0.738\nentropy = 0.998\nsamples = 51
\nvalue = [24, 27]'),
 Text(702.2773972602739, 24.159999999999968, 'entropy = 0.764\nsamples = 27\nvalue = [21,
6]'),
 Text(708.0102739726027, 24.159999999999968, 'entropy = 0.544\nsamples = 24\nvalue = [3, 2
1]'),
 Text(729.5085616438356, 169.12, 'X[4] <= 0.734\nentropy = 0.68\nsamples = 406\nvalue = [7
3, 333]'),
 Text(722.3424657534246, 120.80000000000001, 'X[3] <= 0.402\nentropy = 0.601\nsamples = 37
5\nvalue = [55, 320]'),
 Text(716.6095890410959, 72.48000000000002, 'X[1] <= 0.335\nentropy = 0.934\nsamples = 83
\nvalue = [29, 54]'),
 Text(713.7431506849315, 24.159999999999968, 'entropy = 0.987\nsamples = 30\nvalue = [17,
13]'),
```

```
 Text(719.4760273972602, 24.159999999999968, 'entropy = 0.772\nsamples = 53\nvalue = [12,
41]'),
 Text(728.0753424657534, 72.48000000000002, 'X[0] <= 0.652\nentropy = 0.433\nsamples = 292
\nvalue = [26, 266]'),
 Text(725.208904109589, 24.159999999999968, 'entropy = 0.786\nsamples = 81\nvalue = [19, 6
2]'),
 Text(730.9417808219177, 24.159999999999968, 'entropy = 0.21\nsamples = 211\nvalue = [7, 2
04]'),
 Text(736.6746575342465, 120.80000000000001, 'X[0] <= 0.61\nentropy = 0.981\nsamples = 31
\nvalue = [18, 13]'),
 Text(733.8082191780821, 72.48000000000002, 'entropy = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(739.5410958904109, 72.48000000000002, 'X[0] <= 0.675\nentropy = 0.855\nsamples = 25
\nvalue = [18, 7]'),
 Text(736.6746575342465, 24.159999999999968, 'entropy = 0.977\nsamples = 17\nvalue = [10,
7]'),
 Text(742.4075342465753, 24.159999999999968, 'entropy = 0.0\nsamples = 8\nvalue = [8,
0]'),
 Text(791.1369863013698, 217.44, 'X[0] <= 0.527\nentropy = 0.548\nsamples = 1677\nvalue =
[212, 1465]'),
 Text(768.2054794520548, 169.12, 'X[1] <= 0.494\nentropy = 0.72\nsamples = 537\nvalue = [1
07, 430]'),
 Text(756.7397260273972, 120.80000000000001, 'X[4] <= 0.667\nentropy = 0.952\nsamples = 18
0\nvalue = [67, 113]'),
 Text(751.0068493150684, 72.48000000000002, 'X[3] <= 0.368\nentropy = 0.978\nsamples = 97
\nvalue = [57, 40]'),
 Text(748.1404109589041, 24.159999999999968, 'entropy = 0.414\nsamples = 36\nvalue = [33,
3]'),
 Text(753.8732876712328, 24.159999999999968, 'entropy = 0.967\nsamples = 61\nvalue = [24,
37]'),
 Text(762.472602739726, 72.48000000000002, 'X[3] <= 0.671\nentropy = 0.531\nsamples = 83\n
value = [10, 73]'),
 Text(759.6061643835616, 24.159999999999968, 'entropy = 0.201\nsamples = 64\nvalue = [2, 6
2]'),
 Text(765.3390410958904, 24.159999999999968, 'entropy = 0.982\nsamples = 19\nvalue = [8, 1
1]'),
 Text(779.6712328767122, 120.80000000000001, 'X[4] <= 0.496\nentropy = 0.506\nsamples = 35
7\nvalue = [40, 317]'),
 Text(773.9383561643835, 72.48000000000002, 'X[1] <= 0.628\nentropy = 0.965\nsamples = 41
\nvalue = [16, 25]'),
 Text(771.0719178082192, 24.159999999999968, 'entropy = 0.503\nsamples = 9\nvalue = [8,
1]'),
 Text(776.804794520548, 24.159999999999968, 'entropy = 0.811\nsamples = 32\nvalue = [8, 2
4]'),
 Text(785.404109589041, 72.48000000000002, 'X[2] <= 0.61\nentropy = 0.388\nsamples = 316\n
value = [24, 292]'),
 Text(782.5376712328766, 24.159999999999968, 'entropy = 0.477\nsamples = 224\nvalue = [23,
201]'),
 Text(788.2705479452054, 24.159999999999968, 'entropy = 0.087\nsamples = 92\nvalue = [1, 9
1]'),
 Text(814.0684931506848, 169.12, 'X[4] <= 0.505\nentropy = 0.443\nsamples = 1140\nvalue =
[105, 1035]'),
 Text(802.6027397260274, 120.80000000000001, 'X[1] <= 0.421\nentropy = 0.656\nsamples = 27
2\nvalue = [46, 226]'),
 Text(796.8698630136986, 72.48000000000002, 'X[0] <= 0.775\nentropy = 0.998\nsamples = 17
\nvalue = [8, 9]'),
 Text(794.0034246575342, 24.159999999999968, 'entropy = 0.592\nsamples = 7\nvalue = [6,
1]'),
 Text(799.736301369863, 24.159999999999968, 'entropy = 0.722\nsamples = 10\nvalue = [2,
8]'),
 Text(808.335616438356, 72.48000000000002, 'X[3] <= 0.659\nentropy = 0.607\nsamples = 255
\nvalue = [38, 217]'),
 Text(805.4691780821918, 24.159999999999968, 'entropy = 0.66\nsamples = 222\nvalue = [38,
184]'),
 Text(811.2020547945204, 24.159999999999968, 'entropy = 0.0\nsamples = 33\nvalue = [0, 3
3]'),
 Text(825.5342465753424, 120.80000000000001, 'X[4] <= 0.761\nentropy = 0.358\nsamples = 86
```

```
8\nvalue = [59, 809]'),
 Text(819.8013698630136, 72.48000000000002, 'X[3] <= 0.419\nentropy = 0.343\nsamples = 859
\nvalue = [55, 804]'),
 Text(816.9349315068492, 24.159999999999968, 'entropy = 0.479\nsamples = 291\nvalue = [30,
261]'),
 Text(822.667808219178, 24.159999999999968, 'entropy = 0.26\nsamples = 568\nvalue = [25, 5
43]'),
 Text(831.2671232876712, 72.48000000000002, 'X[0] <= 0.581\nentropy = 0.991\nsamples = 9\n
value = [4, 5]'),
 Text(828.4006849315068, 24.159999999999968, 'entropy = 0.0\nsamples = 5\nvalue = [0,
5]'),
 Text(834.1335616438356, 24.159999999999968, 'entropy = 0.0\nsamples = 4\nvalue = [4,
0]')]
```



In [145…
```
dotfile = open("data/tree_max_depth_entropy.dot", 'w')
tree.export_graphviz(clf5, out_file = dotfile, feature_names = xtrain.columns)
dotfile.close()
```

In [48]:
```
ypred5 = clf5.predict(xtest)
```

In [49]:
```
scores5 = cross_val_score(clf5, xtrain, ytrain, cv=5)
scores5
```

Out[49]:
```
array([0.83736559, 0.83803763, 0.84408602, 0.85743107, 0.83187626])
```

In [50]:
```
print("%0.4f accuracy with a standard deviation of %0.4f" % (scores5.mean(), scores5.std()
```

```
0.8418 accuracy with a standard deviation of 0.0087
```

In [51]:
```
hyperparameters = hyperparameters.append({'hyperparameters':'max_depth + entropy', 'accura
```

max_leaf_nodes

Nastavením tohto hyperparametra sa zastaví ďalšie delenie stromu po dosiahnutí počtu listov zadaného v hodnote parametra. Strom sa generuje best-first algoritmom a za najlepšie elementy sa považujú tie s najnižšou

"impurity".

In [52]:
```
clf6 = tree.DecisionTreeClassifier(max_leaf_nodes=340)
clf6 = clf6.fit(xtrain, ytrain)
plt.figure(figsize=(15,8))
tree.plot_tree(clf6)
```

Out[52]:
```
[Text(199.53886566270407, 424.008, 'X[1] <= 0.287\ngini = 0.458\nsamples = 7438\nvalue =
[2636, 4802]'),
 Text(48.97103442157559, 402.264, 'X[0] <= 0.439\ngini = 0.409\nsamples = 1370\nvalue = [9
78, 392]'),
 Text(9.504613200851669, 380.52, 'X[3] <= 0.391\ngini = 0.168\nsamples = 194\nvalue = [18,
176]'),
 Text(4.752306600425834, 358.776, 'X[0] <= 0.417\ngini = 0.122\nsamples = 184\nvalue = [1
2, 172]'),
 Text(2.376153300212917, 337.032, 'gini = 0.071\nsamples = 162\nvalue = [6, 156]'),
 Text(7.1284599006387515, 337.032, 'X[4] <= 0.475\ngini = 0.397\nsamples = 22\nvalue = [6,
16]'),
 Text(4.752306600425834, 315.288, 'X[4] <= 0.344\ngini = 0.48\nsamples = 15\nvalue = [6,
9]'),
 Text(2.376153300212917, 293.544, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(7.1284599006387515, 293.544, 'X[3] <= 0.112\ngini = 0.496\nsamples = 11\nvalue = [6,
5]'),
 Text(4.752306600425834, 271.8, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(9.504613200851669, 271.8, 'X[2] <= 0.238\ngini = 0.444\nsamples = 9\nvalue = [6,
3]'),
 Text(7.1284599006387515, 250.05599999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(11.880766501064585, 250.05599999999998, 'X[2] <= 0.689\ngini = 0.245\nsamples = 7\nv
alue = [6, 1]'),
 Text(9.504613200851669, 228.312, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(14.256919801277503, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(9.504613200851669, 315.288, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(14.256919801277503, 358.776, 'X[0] <= 0.378\ngini = 0.48\nsamples = 10\nvalue = [6,
4]'),
 Text(11.880766501064585, 337.032, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(16.63307310149042, 337.032, 'X[4] <= 0.532\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(14.256919801277503, 315.288, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(19.009226401703337, 315.288, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(88.43745564229951, 380.52, 'X[1] <= 0.206\ngini = 0.3\nsamples = 1176\nvalue = [960,
216]'),
 Text(45.74095102909865, 358.776, 'X[0] <= 0.528\ngini = 0.179\nsamples = 675\nvalue = [60
8, 67]'),
 Text(29.701916252661466, 337.032, 'X[4] <= 0.499\ngini = 0.465\nsamples = 49\nvalue = [3
1, 18]'),
 Text(23.76153300212917, 315.288, 'X[3] <= 0.157\ngini = 0.257\nsamples = 33\nvalue = [28,
5]'),
 Text(19.009226401703337, 293.544, 'X[2] <= 0.287\ngini = 0.32\nsamples = 5\nvalue = [1,
4]'),
 Text(16.63307310149042, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(21.385379701916253, 271.8, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(28.513839602555006, 293.544, 'X[2] <= 0.174\ngini = 0.069\nsamples = 28\nvalue = [2
7, 1]'),
 Text(26.13768630234209, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(30.889992902767922, 271.8, 'gini = 0.0\nsamples = 27\nvalue = [27, 0]'),
 Text(35.642299503193755, 315.288, 'X[3] <= 0.413\ngini = 0.305\nsamples = 16\nvalue = [3,
13]'),
 Text(33.26614620298084, 293.544, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(38.018452803406674, 293.544, 'X[0] <= 0.504\ngini = 0.375\nsamples = 4\nvalue = [3,
1]'),
 Text(35.642299503193755, 271.8, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(40.394606103619594, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(61.779985805535844, 337.032, 'X[0] <= 0.837\ngini = 0.144\nsamples = 626\nvalue = [5
77, 49]'),
```

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 Text(52.27537260468418, 315.288, 'X[4] <= 0.804\ngini = 0.109\nsamples = 569\nvalue = [53
6, 33]'),
 Text(47.52306600425834, 293.544, 'X[4] <= 0.67\ngini = 0.095\nsamples = 561\nvalue = [53
3, 28]'),
 Text(45.14691270404543, 271.8, 'gini = 0.051\nsamples = 458\nvalue = [446, 12]'),
 Text(49.89921930447126, 271.8, 'X[3] <= 0.595\ngini = 0.262\nsamples = 103\nvalue = [87,
16]'),
 Text(47.52306600425834, 250.05599999999998, 'X[3] <= 0.425\ngini = 0.473\nsamples = 13\nv
alue = [5, 8]'),
 Text(45.14691270404543, 228.312, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(49.89921930447126, 228.312, 'X[1] <= 0.129\ngini = 0.397\nsamples = 11\nvalue = [3,
8]'),
 Text(47.52306600425834, 206.56799999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(52.27537260468418, 206.56799999999998, 'X[0] <= 0.641\ngini = 0.198\nsamples = 9\nva
lue = [1, 8]'),
 Text(49.89921930447126, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(54.65152590489709, 184.824, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(52.27537260468418, 250.05599999999998, 'gini = 0.162\nsamples = 90\nvalue = [82,
8]'),
 Text(57.02767920511001, 293.544, 'X[0] <= 0.757\ngini = 0.469\nsamples = 8\nvalue = [3,
5]'),
 Text(54.65152590489709, 271.8, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(59.40383250532293, 271.8, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(71.28459900638751, 315.288, 'X[2] <= 0.458\ngini = 0.404\nsamples = 57\nvalue = [41,
16]'),
 Text(66.53229240596168, 293.544, 'X[4] <= 0.704\ngini = 0.499\nsamples = 19\nvalue = [9,
10]'),
 Text(64.15613910574876, 271.8, 'X[3] <= 0.466\ngini = 0.408\nsamples = 14\nvalue = [4, 1
0]'),
 Text(61.779985805535844, 250.05599999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(66.53229240596168, 250.05599999999998, 'X[2] <= 0.282\ngini = 0.165\nsamples = 11\nv
alue = [1, 10]'),
 Text(64.15613910574876, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(68.9084457061746, 228.312, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(68.9084457061746, 271.8, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(76.03690560681335, 293.544, 'X[2] <= 0.88\ngini = 0.266\nsamples = 38\nvalue = [32,
6]'),
 Text(73.66075230660043, 271.8, 'X[0] <= 0.84\ngini = 0.234\nsamples = 37\nvalue = [32,
5]'),
 Text(71.28459900638751, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(76.03690560681335, 250.05599999999998, 'X[1] <= 0.149\ngini = 0.198\nsamples = 36\nv
alue = [32, 4]'),
 Text(73.66075230660043, 228.312, 'gini = 0.067\nsamples = 29\nvalue = [28, 1]'),
 Text(78.41305890702627, 228.312, 'X[2] <= 0.612\ngini = 0.49\nsamples = 7\nvalue = [4,
3]'),
 Text(76.03690560681335, 206.56799999999998, 'X[2] <= 0.527\ngini = 0.375\nsamples = 4\nva
lue = [1, 3]'),
 Text(73.66075230660043, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(78.41305890702627, 184.824, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(80.78921220723919, 206.56799999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(78.41305890702627, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(131.13396025550037, 358.776, 'X[4] <= 0.644\ngini = 0.418\nsamples = 501\nvalue = [3
52, 149]'),
 Text(113.16430092264018, 337.032, 'X[0] <= 0.698\ngini = 0.333\nsamples = 355\nvalue = [2
80, 75]'),
 Text(102.76863023420867, 315.288, 'X[0] <= 0.508\ngini = 0.252\nsamples = 284\nvalue = [2
42, 42]'),
 Text(96.23420865862315, 293.544, 'X[3] <= 0.321\ngini = 0.468\nsamples = 75\nvalue = [47,
28]'),
 Text(90.29382540809085, 271.8, 'X[1] <= 0.237\ngini = 0.476\nsamples = 41\nvalue = [16, 2
5]'),
 Text(85.54151880766501, 250.05599999999998, 'X[4] <= 0.293\ngini = 0.219\nsamples = 16\nv
alue = [2, 14]'),
 Text(83.1653655074521, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(87.91767210787793, 228.312, 'gini = 0.124\nsamples = 15\nvalue = [1, 14]'),
 Text(95.04613200851668, 250.05599999999998, 'X[3] <= 0.175\ngini = 0.493\nsamples = 25\nv
```

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alue = [14, 11]'),
 Text(92.66997870830377, 228.312, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(97.4222853087296, 228.312, 'X[2] <= 0.354\ngini = 0.475\nsamples = 18\nvalue = [7, 1
1]'),
 Text(95.04613200851668, 206.56799999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(99.79843860894252, 206.56799999999998, 'gini = 0.391\nsamples = 15\nvalue = [4, 1
1]'),
 Text(102.17459190915544, 271.8, 'X[2] <= 0.836\ngini = 0.161\nsamples = 34\nvalue = [31,
3]'),
 Text(99.79843860894252, 250.05599999999998, 'gini = 0.114\nsamples = 33\nvalue = [31,
2]'),
 Text(104.55074520936836, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(109.30305180979418, 293.544, 'X[1] <= 0.287\ngini = 0.125\nsamples = 209\nvalue = [1
95, 14]'),
 Text(106.92689850958128, 271.8, 'gini = 0.117\nsamples = 208\nvalue = [195, 13]'),
 Text(111.6792051100071, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(123.55997161107169, 315.288, 'X[4] <= 0.517\ngini = 0.498\nsamples = 71\nvalue = [3
8, 33]'),
 Text(118.80766501064586, 293.544, 'X[0] <= 0.969\ngini = 0.184\nsamples = 39\nvalue = [3
5, 4]'),
 Text(116.43151171043294, 271.8, 'gini = 0.145\nsamples = 38\nvalue = [35, 3]'),
 Text(121.18381831085877, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(128.31227821149753, 293.544, 'X[3] <= 0.295\ngini = 0.17\nsamples = 32\nvalue = [3,
29]'),
 Text(125.93612491128461, 271.8, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(130.68843151171043, 271.8, 'gini = 0.0\nsamples = 29\nvalue = [0, 29]'),
 Text(149.10361958836054, 337.032, 'X[3] <= 0.603\ngini = 0.5\nsamples = 146\nvalue = [72,
74]'),
 Text(139.00496806245565, 315.288, 'X[0] <= 0.687\ngini = 0.412\nsamples = 62\nvalue = [1
8, 44]'),
 Text(136.62881476224274, 293.544, 'gini = 0.114\nsamples = 33\nvalue = [2, 31]'),
 Text(141.38112136266858, 293.544, 'X[2] <= 0.398\ngini = 0.495\nsamples = 29\nvalue = [1
6, 13]'),
 Text(135.44073811213627, 271.8, 'X[4] <= 0.744\ngini = 0.32\nsamples = 10\nvalue = [2,
8]'),
 Text(133.06458481192337, 250.05599999999998, 'X[2] <= 0.163\ngini = 0.198\nsamples = 9\nv
alue = [1, 8]'),
 Text(130.68843151171043, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(135.44073811213627, 228.312, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(137.8168914123492, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(147.32150461320086, 271.8, 'X[4] <= 0.682\ngini = 0.388\nsamples = 19\nvalue = [14,
5]'),
 Text(142.56919801277502, 250.05599999999998, 'X[0] <= 0.761\ngini = 0.5\nsamples = 8\nval
ue = [4, 4]'),
 Text(140.1930447125621, 228.312, 'gini = 0.32\nsamples = 5\nvalue = [4, 1]'),
 Text(144.94535131298795, 228.312, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(152.0738112136267, 250.05599999999998, 'X[3] <= 0.457\ngini = 0.165\nsamples = 11\nv
alue = [10, 1]'),
 Text(149.6976579134138, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(154.4499645138396, 228.312, 'gini = 0.0\nsamples = 10\nvalue = [10, 0]'),
 Text(159.20227111426544, 315.288, 'X[0] <= 0.825\ngini = 0.459\nsamples = 84\nvalue = [5
4, 30]'),
 Text(156.82611781405254, 293.544, 'X[4] <= 0.856\ngini = 0.444\nsamples = 81\nvalue = [5
4, 27]'),
 Text(154.4499645138396, 271.8, 'gini = 0.429\nsamples = 77\nvalue = [53, 24]'),
 Text(159.20227111426544, 271.8, 'X[1] <= 0.257\ngini = 0.375\nsamples = 4\nvalue = [1,
3]'),
 Text(156.82611781405254, 250.05599999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(161.57842441447838, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(161.57842441447838, 293.544, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(350.1066969038325, 402.264, 'X[0] <= 0.405\ngini = 0.397\nsamples = 6068\nvalue = [1
658, 4410]'),
 Text(194.91882540809087, 380.52, 'X[3] <= 0.193\ngini = 0.189\nsamples = 1996\nvalue = [2
11, 1785]'),
 Text(175.83534421575587, 358.776, 'X[1] <= 0.634\ngini = 0.427\nsamples = 55\nvalue = [3
8, 17]'),
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 Text(171.08303761533003, 337.032, 'X[4] <= 0.356\ngini = 0.273\nsamples = 43\nvalue = [3
6, 7]'),
 Text(168.70688431511712, 315.288, 'X[0] <= 0.289\ngini = 0.408\nsamples = 7\nvalue = [2,
5]'),
 Text(166.3307310149042, 293.544, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(171.08303761533003, 293.544, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(173.45919091554296, 315.288, 'gini = 0.105\nsamples = 36\nvalue = [34, 2]'),
 Text(180.5876508161817, 337.032, 'X[3] <= 0.186\ngini = 0.278\nsamples = 12\nvalue = [2,
10]'),
 Text(178.21149751596877, 315.288, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(182.9638041163946, 315.288, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(214.00230660042584, 358.776, 'X[4] <= 0.374\ngini = 0.162\nsamples = 1941\nvalue =
[173, 1768]'),
 Text(211.62615330021293, 337.032, 'gini = 0.093\nsamples = 1209\nvalue = [59, 1150]'),
 Text(216.37845990063877, 337.032, 'X[1] <= 0.513\ngini = 0.263\nsamples = 732\nvalue = [1
14, 618]'),
 Text(187.71611071682045, 315.288, 'X[3] <= 0.237\ngini = 0.187\nsamples = 441\nvalue = [4
6, 395]'),
 Text(179.9936124911285, 293.544, 'X[1] <= 0.328\ngini = 0.473\nsamples = 13\nvalue = [8,
5]'),
 Text(177.61745919091555, 271.8, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(182.3697657913414, 271.8, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(195.43860894251245, 293.544, 'X[0] <= 0.325\ngini = 0.162\nsamples = 428\nvalue = [3
8, 390]'),
 Text(187.12207239176723, 271.8, 'X[2] <= 0.737\ngini = 0.094\nsamples = 242\nvalue = [12,
230]'),
 Text(184.7459190915543, 250.05599999999998, 'gini = 0.054\nsamples = 215\nvalue = [6, 20
9]'),
 Text(189.49822569198014, 250.05599999999998, 'X[2] <= 0.785\ngini = 0.346\nsamples = 27\n
value = [6, 21]'),
 Text(187.12207239176723, 228.312, 'X[2] <= 0.771\ngini = 0.494\nsamples = 9\nvalue = [5,
4]'),
 Text(184.7459190915543, 206.56799999999998, 'gini = 0.444\nsamples = 6\nvalue = [2, 4]'),
 Text(189.49822569198014, 206.56799999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(191.87437899219307, 228.312, 'gini = 0.105\nsamples = 18\nvalue = [1, 17]'),
 Text(203.75514549325766, 271.8, 'X[4] <= 0.456\ngini = 0.24\nsamples = 186\nvalue = [26,
160]'),
 Text(199.00283889283182, 250.05599999999998, 'X[0] <= 0.327\ngini = 0.124\nsamples = 90\n
value = [6, 84]'),
 Text(196.62668559261888, 228.312, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(201.37899219304472, 228.312, 'gini = 0.087\nsamples = 88\nvalue = [4, 84]'),
 Text(208.50745209368347, 250.05599999999998, 'X[4] <= 0.64\ngini = 0.33\nsamples = 96\nva
lue = [20, 76]'),
 Text(206.13129879347056, 228.312, 'X[3] <= 0.61\ngini = 0.391\nsamples = 75\nvalue = [20,
55]'),
 Text(203.75514549325766, 206.56799999999998, 'X[3] <= 0.382\ngini = 0.349\nsamples = 71\n
value = [16, 55]'),
 Text(199.00283889283182, 184.824, 'X[1] <= 0.387\ngini = 0.48\nsamples = 25\nvalue = [10,
15]'),
 Text(196.62668559261888, 163.07999999999998, 'X[4] <= 0.456\ngini = 0.278\nsamples = 18\n
value = [3, 15]'),
 Text(194.25053229240598, 141.336, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(199.00283889283182, 141.336, 'X[2] <= 0.261\ngini = 0.208\nsamples = 17\nvalue = [2,
15]'),
 Text(196.62668559261888, 119.59199999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(201.37899219304472, 119.59199999999998, 'gini = 0.117\nsamples = 16\nvalue = [1, 1
5]'),
 Text(201.37899219304472, 163.07999999999998, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(208.50745209368347, 184.824, 'X[2] <= 0.605\ngini = 0.227\nsamples = 46\nvalue = [6,
40]'),
 Text(206.13129879347056, 163.07999999999998, 'gini = 0.108\nsamples = 35\nvalue = [2, 3
3]'),
 Text(210.8836053938964, 163.07999999999998, 'X[4] <= 0.508\ngini = 0.463\nsamples = 11\nv
alue = [4, 7]'),
 Text(208.50745209368347, 141.336, 'X[1] <= 0.323\ngini = 0.219\nsamples = 8\nvalue = [1,
7]'),
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 Text(206.13129879347056, 119.59199999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(210.8836053938964, 119.59199999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(213.2597586941093, 141.336, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(208.50745209368347, 206.56799999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(210.8836053938964, 228.312, 'gini = 0.0\nsamples = 21\nvalue = [0, 21]'),
 Text(245.0408090844571, 315.288, 'X[4] <= 0.604\ngini = 0.358\nsamples = 291\nvalue = [6
8, 223]'),
 Text(235.2391767210788, 293.544, 'X[3] <= 0.513\ngini = 0.454\nsamples = 184\nvalue = [6
4, 120]'),
 Text(222.764371894961, 271.8, 'X[1] <= 0.755\ngini = 0.441\nsamples = 73\nvalue = [49, 2
4]'),
 Text(218.01206529453515, 250.05599999999998, 'X[0] <= 0.158\ngini = 0.282\nsamples = 53\n
value = [44, 9]'),
 Text(215.63591199432224, 228.312, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(220.38821859474805, 228.312, 'gini = 0.237\nsamples = 51\nvalue = [44, 7]'),
 Text(227.51667849538683, 250.05599999999998, 'X[3] <= 0.437\ngini = 0.375\nsamples = 20\n
value = [5, 15]'),
 Text(225.1405251951739, 228.312, 'gini = 0.133\nsamples = 14\nvalue = [1, 13]'),
 Text(229.89283179559973, 228.312, 'X[0] <= 0.398\ngini = 0.444\nsamples = 6\nvalue = [4,
2]'),
 Text(227.51667849538683, 206.56799999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(232.26898509581264, 206.56799999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(247.71398154719662, 271.8, 'X[1] <= 0.671\ngini = 0.234\nsamples = 111\nvalue = [15,
96]'),
 Text(241.77359829666432, 250.05599999999998, 'X[4] <= 0.567\ngini = 0.112\nsamples = 84\n
value = [5, 79]'),
 Text(239.3974449964514, 228.312, 'X[2] <= 0.163\ngini = 0.071\nsamples = 81\nvalue = [3,
78]'),
 Text(237.02129169623848, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(241.77359829666432, 206.56799999999998, 'gini = 0.049\nsamples = 80\nvalue = [2, 7
8]'),
 Text(244.14975159687722, 228.312, 'gini = 0.444\nsamples = 3\nvalue = [2, 1]'),
 Text(253.6543647977289, 250.05599999999998, 'X[3] <= 0.667\ngini = 0.466\nsamples = 27\nv
alue = [10, 17]'),
 Text(248.90205819730306, 228.312, 'X[4] <= 0.501\ngini = 0.492\nsamples = 16\nvalue = [9,
7]'),
 Text(246.52590489709016, 206.56799999999998, 'X[2] <= 0.84\ngini = 0.18\nsamples = 10\nva
lue = [9, 1]'),
 Text(244.14975159687722, 184.824, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(248.90205819730306, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(251.278211497516, 206.56799999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(258.40667139815474, 228.312, 'X[2] <= 0.176\ngini = 0.165\nsamples = 11\nvalue = [1,
10]'),
 Text(256.0305180979418, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(260.7828246983677, 206.56799999999998, 'gini = 0.0\nsamples = 10\nvalue = [0, 10]'),
 Text(254.84244144783537, 293.544, 'X[2] <= 0.113\ngini = 0.072\nsamples = 107\nvalue =
[4, 103]'),
 Text(252.46628814762244, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(257.2185947480483, 271.8, 'gini = 0.055\nsamples = 106\nvalue = [3, 103]'),
 Text(505.2945683995742, 380.52, 'X[4] <= 0.426\ngini = 0.458\nsamples = 4072\nvalue = [14
47, 2625]'),
 Text(344.3009004613201, 358.776, 'X[0] <= 0.485\ngini = 0.475\nsamples = 1473\nvalue = [9
00, 573]'),
 Text(287.66305890702625, 337.032, 'X[3] <= 0.197\ngini = 0.403\nsamples = 447\nvalue = [1
25, 322]'),
 Text(278.0099361249113, 315.288, 'X[1] <= 0.307\ngini = 0.245\nsamples = 7\nvalue = [6,
1]'),
 Text(275.6337828246984, 293.544, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(280.3860894251242, 293.544, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(297.3161816891413, 315.288, 'X[1] <= 0.866\ngini = 0.395\nsamples = 440\nvalue = [11
9, 321]'),
 Text(285.13839602555004, 293.544, 'X[4] <= 0.235\ngini = 0.387\nsamples = 434\nvalue = [1
14, 320]'),
 Text(267.9112845990064, 271.8, 'X[1] <= 0.412\ngini = 0.233\nsamples = 89\nvalue = [12, 7
7]'),
 Text(265.5351312987935, 250.05599999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
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 Text(270.2874378992193, 250.05599999999998, 'X[2] <= 0.954\ngini = 0.187\nsamples = 86\nv
alue = [9, 77]'),
 Text(267.9112845990064, 228.312, 'gini = 0.171\nsamples = 85\nvalue = [8, 77]'),
 Text(272.66359119943223, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(302.3655074520937, 271.8, 'X[1] <= 0.682\ngini = 0.416\nsamples = 345\nvalue = [102,
243]'),
 Text(289.29666430092266, 250.05599999999998, 'X[3] <= 0.55\ngini = 0.382\nsamples = 303\n
value = [78, 225]'),
 Text(277.4158977998581, 228.312, 'X[1] <= 0.531\ngini = 0.421\nsamples = 219\nvalue = [6
6, 153]'),
 Text(265.5351312987935, 206.56799999999998, 'X[3] <= 0.54\ngini = 0.347\nsamples = 170\nv
alue = [38, 132]'),
 Text(263.15897799858055, 184.824, 'X[0] <= 0.435\ngini = 0.337\nsamples = 168\nvalue = [3
6, 132]'),
 Text(260.7828246983677, 163.07999999999998, 'gini = 0.229\nsamples = 76\nvalue = [10, 6
6]'),
 Text(265.5351312987935, 163.07999999999998, 'X[1] <= 0.425\ngini = 0.405\nsamples = 92\nv
alue = [26, 66]'),
 Text(258.40667139815474, 141.336, 'X[4] <= 0.415\ngini = 0.488\nsamples = 38\nvalue = [1
6, 22]'),
 Text(256.0305180979418, 119.59199999999998, 'X[1] <= 0.341\ngini = 0.5\nsamples = 32\nval
ue = [16, 16]'),
 Text(251.278211497516, 97.84800000000001, 'X[4] <= 0.255\ngini = 0.245\nsamples = 7\nvalu
e = [1, 6]'),
 Text(248.90205819730306, 76.10399999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(253.6543647977289, 76.10399999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(260.7828246983677, 97.84800000000001, 'X[4] <= 0.402\ngini = 0.48\nsamples = 25\nval
ue = [15, 10]'),
 Text(258.40667139815474, 76.10399999999998, 'X[4] <= 0.306\ngini = 0.499\nsamples = 21\nv
alue = [11, 10]'),
 Text(256.0305180979418, 54.360000000000014, 'gini = 0.278\nsamples = 6\nvalue = [5, 1]'),
 Text(260.7828246983677, 54.360000000000014, 'X[3] <= 0.409\ngini = 0.48\nsamples = 15\nva
lue = [6, 9]'),
 Text(258.40667139815474, 32.615999999999985, 'gini = 0.219\nsamples = 8\nvalue = [1,
7]'),
 Text(263.15897799858055, 32.615999999999985, 'X[2] <= 0.458\ngini = 0.408\nsamples = 7\nv
alue = [5, 2]'),
 Text(260.7828246983677, 10.872000000000014, 'gini = 0.444\nsamples = 3\nvalue = [1, 2]'),
 Text(265.5351312987935, 10.872000000000014, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(263.15897799858055, 76.10399999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(260.7828246983677, 119.59199999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(272.66359119943223, 141.336, 'X[3] <= 0.309\ngini = 0.302\nsamples = 54\nvalue = [1
0, 44]'),
 Text(267.9112845990064, 119.59199999999998, 'X[1] <= 0.457\ngini = 0.444\nsamples = 6\nva
lue = [4, 2]'),
 Text(265.5351312987935, 97.84800000000001, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(270.2874378992193, 97.84800000000001, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(277.4158977998581, 119.59199999999998, 'X[4] <= 0.245\ngini = 0.219\nsamples = 48\nv
alue = [6, 42]'),
 Text(275.03974449964517, 97.84800000000001, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(279.792051100071, 97.84800000000001, 'gini = 0.19\nsamples = 47\nvalue = [5, 42]'),
 Text(267.9112845990064, 184.824, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(289.29666430092266, 206.56799999999998, 'X[1] <= 0.609\ngini = 0.49\nsamples = 49\nv
alue = [28, 21]'),
 Text(286.9205110007097, 184.824, 'X[3] <= 0.467\ngini = 0.499\nsamples = 40\nvalue = [19,
21]'),
 Text(284.54435770049685, 163.07999999999998, 'gini = 0.337\nsamples = 14\nvalue = [11,
3]'),
 Text(289.29666430092266, 163.07999999999998, 'X[3] <= 0.514\ngini = 0.426\nsamples = 26\n
value = [8, 18]'),
 Text(284.54435770049685, 141.336, 'X[1] <= 0.6\ngini = 0.142\nsamples = 13\nvalue = [1, 1
2]'),
 Text(282.1682044002839, 119.59199999999998, 'gini = 0.0\nsamples = 12\nvalue = [0, 12]'),
 Text(286.9205110007097, 119.59199999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(294.0489709013485, 141.336, 'X[1] <= 0.55\ngini = 0.497\nsamples = 13\nvalue = [7,
6]'),
```

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 Text(291.6728176011356, 119.59199999999998, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(296.4251242015614, 119.59199999999998, 'X[2] <= 0.774\ngini = 0.375\nsamples = 8\nva
lue = [2, 6]'),
 Text(294.0489709013485, 97.84800000000001, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(298.80127750177434, 97.84800000000001, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(291.6728176011356, 184.824, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(301.17743080198727, 228.312, 'X[1] <= 0.579\ngini = 0.245\nsamples = 84\nvalue = [1
2, 72]'),
 Text(298.80127750177434, 206.56799999999998, 'X[3] <= 0.596\ngini = 0.389\nsamples = 34\n
value = [9, 25]'),
 Text(296.4251242015614, 184.824, 'gini = 0.147\nsamples = 25\nvalue = [2, 23]'),
 Text(301.17743080198727, 184.824, 'X[2] <= 0.379\ngini = 0.346\nsamples = 9\nvalue = [7,
2]'),
 Text(298.80127750177434, 163.07999999999998, 'gini = 0.444\nsamples = 3\nvalue = [1,
2]'),
 Text(303.55358410220015, 163.07999999999998, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(303.55358410220015, 206.56799999999998, 'gini = 0.113\nsamples = 50\nvalue = [3, 4
7]'),
 Text(315.43435060326476, 250.05599999999998, 'X[3] <= 0.688\ngini = 0.49\nsamples = 42\nv
alue = [24, 18]'),
 Text(310.6820440028389, 228.312, 'X[4] <= 0.415\ngini = 0.227\nsamples = 23\nvalue = [20,
3]'),
 Text(308.305890702626, 206.56799999999998, 'gini = 0.165\nsamples = 22\nvalue = [20,
2]'),
 Text(313.0581973030518, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(320.1866572036906, 228.312, 'X[0] <= 0.456\ngini = 0.332\nsamples = 19\nvalue = [4,
15]'),
 Text(317.8105039034777, 206.56799999999998, 'X[2] <= 0.115\ngini = 0.208\nsamples = 17\nv
alue = [2, 15]'),
 Text(315.43435060326476, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(320.1866572036906, 184.824, 'gini = 0.117\nsamples = 16\nvalue = [1, 15]'),
 Text(322.5628105039035, 206.56799999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(309.49396735273245, 293.544, 'X[1] <= 0.934\ngini = 0.278\nsamples = 6\nvalue = [5,
1]'),
 Text(307.1178140525195, 271.8, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(311.8701206529454, 271.8, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(400.93874201561397, 337.032, 'X[3] <= 0.449\ngini = 0.37\nsamples = 1026\nvalue = [7
75, 251]'),
 Text(355.53193754435773, 315.288, 'X[1] <= 0.617\ngini = 0.488\nsamples = 281\nvalue = [1
62, 119]'),
 Text(340.9779985805536, 293.544, 'X[0] <= 0.525\ngini = 0.451\nsamples = 236\nvalue = [15
5, 81]'),
 Text(329.69127040454225, 271.8, 'X[0] <= 0.49\ngini = 0.492\nsamples = 57\nvalue = [25, 3
2]'),
 Text(327.3151171043293, 250.05599999999998, 'gini = 0.298\nsamples = 11\nvalue = [9,
2]'),
 Text(332.0674237047552, 250.05599999999998, 'X[4] <= 0.421\ngini = 0.454\nsamples = 46\nv
alue = [16, 30]'),
 Text(329.69127040454225, 228.312, 'X[3] <= 0.24\ngini = 0.408\nsamples = 42\nvalue = [12,
30]'),
 Text(327.3151171043293, 206.56799999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(332.0674237047552, 206.56799999999998, 'X[1] <= 0.54\ngini = 0.375\nsamples = 40\nva
lue = [10, 30]'),
 Text(327.3151171043293, 184.824, 'X[3] <= 0.352\ngini = 0.32\nsamples = 35\nvalue = [7, 2
8]'),
 Text(324.93896380411644, 163.07999999999998, 'X[2] <= 0.613\ngini = 0.457\nsamples = 17\n
value = [6, 11]'),
 Text(322.5628105039035, 141.336, 'gini = 0.337\nsamples = 14\nvalue = [3, 11]'),
 Text(327.3151171043293, 141.336, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(329.69127040454225, 163.07999999999998, 'gini = 0.105\nsamples = 18\nvalue = [1, 1
7]'),
 Text(336.819730305181, 184.824, 'X[3] <= 0.413\ngini = 0.48\nsamples = 5\nvalue = [3,
2]'),
 Text(334.44357700496806, 163.07999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(339.19588360539393, 163.07999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(334.44357700496806, 228.312, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
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 Text(352.264726756565, 271.8, 'X[1] <= 0.462\ngini = 0.398\nsamples = 179\nvalue = [130,
49]'),
 Text(343.94819020581974, 250.05599999999998, 'X[0] <= 0.583\ngini = 0.309\nsamples = 115
\nvalue = [93, 22]'),
 Text(339.19588360539393, 228.312, 'X[2] <= 0.302\ngini = 0.473\nsamples = 39\nvalue = [2
4, 15]'),
 Text(336.819730305181, 206.56799999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(341.57203690560686, 206.56799999999998, 'gini = 0.397\nsamples = 33\nvalue = [24,
9]'),
 Text(348.7004968062456, 228.312, 'X[4] <= 0.211\ngini = 0.167\nsamples = 76\nvalue = [69,
7]'),
 Text(346.3243435060327, 206.56799999999998, 'gini = 0.444\nsamples = 3\nvalue = [1, 2]'),
 Text(351.0766501064585, 206.56799999999998, 'gini = 0.128\nsamples = 73\nvalue = [68,
5]'),
 Text(360.58126330731017, 250.05599999999998, 'X[0] <= 0.796\ngini = 0.488\nsamples = 64\n
value = [37, 27]'),
 Text(358.20511000709723, 228.312, 'X[3] <= 0.432\ngini = 0.456\nsamples = 57\nvalue = [3
7, 20]'),
 Text(355.82895670688436, 206.56799999999998, 'X[4] <= 0.227\ngini = 0.395\nsamples = 48\n
value = [35, 13]'),
 Text(353.4528034066714, 184.824, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(358.20511000709723, 184.824, 'X[3] <= 0.373\ngini = 0.364\nsamples = 46\nvalue = [3
5, 11]'),
 Text(353.4528034066714, 163.07999999999998, 'X[1] <= 0.575\ngini = 0.483\nsamples = 22\nv
alue = [13, 9]'),
 Text(351.0766501064585, 141.336, 'X[3] <= 0.359\ngini = 0.432\nsamples = 19\nvalue = [13,
6]'),
 Text(346.3243435060327, 119.59199999999998, 'X[2] <= 0.74\ngini = 0.26\nsamples = 13\nval
ue = [11, 2]'),
 Text(343.94819020581974, 97.84800000000001, 'gini = 0.153\nsamples = 12\nvalue = [11,
1]'),
 Text(348.7004968062456, 97.84800000000001, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(355.82895670688436, 119.59199999999998, 'X[1] <= 0.552\ngini = 0.444\nsamples = 6\nv
alue = [2, 4]'),
 Text(353.4528034066714, 97.84800000000001, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(358.20511000709723, 97.84800000000001, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(355.82895670688436, 141.336, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(362.9574166075231, 163.07999999999998, 'X[1] <= 0.468\ngini = 0.153\nsamples = 24\nv
alue = [22, 2]'),
 Text(360.58126330731017, 141.336, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(365.33356990773603, 141.336, 'gini = 0.083\nsamples = 23\nvalue = [22, 1]'),
 Text(360.58126330731017, 206.56799999999998, 'gini = 0.346\nsamples = 9\nvalue = [2,
7]'),
 Text(362.9574166075231, 228.312, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(370.08587650816185, 293.544, 'X[3] <= 0.423\ngini = 0.263\nsamples = 45\nvalue = [7,
38]'),
 Text(367.7097232079489, 271.8, 'X[0] <= 0.795\ngini = 0.172\nsamples = 42\nvalue = [4, 3
8]'),
 Text(365.33356990773603, 250.05599999999998, 'gini = 0.136\nsamples = 41\nvalue = [3, 3
8]'),
 Text(370.08587650816185, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(372.4620298083748, 271.8, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(446.34554648687015, 315.288, 'X[0] <= 0.544\ngini = 0.292\nsamples = 745\nvalue = [6
13, 132]'),
 Text(423.47507097232085, 293.544, 'X[3] <= 0.718\ngini = 0.468\nsamples = 155\nvalue = [9
7, 58]'),
 Text(412.70812633073103, 271.8, 'X[4] <= 0.413\ngini = 0.45\nsamples = 143\nvalue = [94,
49]'),
 Text(403.05500354861607, 250.05599999999998, 'X[1] <= 0.646\ngini = 0.432\nsamples = 136
\nvalue = [93, 43]'),
 Text(390.8772178850249, 228.312, 'X[1] <= 0.429\ngini = 0.474\nsamples = 96\nvalue = [59,
37]'),
 Text(388.50106458481196, 206.56799999999998, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(393.25337118523777, 206.56799999999998, 'X[4] <= 0.337\ngini = 0.486\nsamples = 89\n
value = [52, 37]'),
 Text(376.02625975869415, 184.824, 'X[3] <= 0.484\ngini = 0.5\nsamples = 55\nvalue = [27,
```

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28]'),
 Text(373.6501064584812, 163.07999999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(378.40241305890703, 163.07999999999998, 'X[4] <= 0.274\ngini = 0.495\nsamples = 49\n
value = [27, 22]'),
 Text(370.08587650816185, 141.336, 'X[1] <= 0.567\ngini = 0.393\nsamples = 26\nvalue = [1
9, 7]'),
 Text(367.7097232079489, 119.59199999999998, 'gini = 0.0\nsamples = 13\nvalue = [13, 0]'),
 Text(372.4620298083748, 119.59199999999998, 'X[3] <= 0.668\ngini = 0.497\nsamples = 13\nv
alue = [6, 7]'),
 Text(370.08587650816185, 97.84800000000001, 'X[2] <= 0.295\ngini = 0.42\nsamples = 10\nva
lue = [3, 7]'),
 Text(367.7097232079489, 76.10399999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(372.4620298083748, 76.10399999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(374.83818310858766, 97.84800000000001, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(386.71894960965227, 141.336, 'X[3] <= 0.541\ngini = 0.454\nsamples = 23\nvalue = [8,
15]'),
 Text(381.96664300922646, 119.59199999999998, 'X[1] <= 0.501\ngini = 0.5\nsamples = 14\nva
lue = [7, 7]'),
 Text(379.5904897090135, 97.84800000000001, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(384.34279630943934, 97.84800000000001, 'X[4] <= 0.28\ngini = 0.42\nsamples = 10\nval
ue = [7, 3]'),
 Text(381.96664300922646, 76.10399999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(386.71894960965227, 76.10399999999998, 'gini = 0.219\nsamples = 8\nvalue = [7, 1]'),
 Text(391.4712562100781, 119.59199999999998, 'X[2] <= 0.767\ngini = 0.198\nsamples = 9\nva
lue = [1, 8]'),
 Text(389.0951029098652, 97.84800000000001, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(393.847409510291, 97.84800000000001, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(410.48048261178144, 184.824, 'X[0] <= 0.534\ngini = 0.389\nsamples = 34\nvalue = [2
5, 9]'),
 Text(408.1043293115685, 163.07999999999998, 'X[1] <= 0.457\ngini = 0.293\nsamples = 28\nv
alue = [23, 5]'),
 Text(403.3520227111427, 141.336, 'X[4] <= 0.371\ngini = 0.5\nsamples = 6\nvalue = [3,
3]'),
 Text(400.97586941092976, 119.59199999999998, 'X[0] <= 0.499\ngini = 0.375\nsamples = 4\nv
alue = [1, 3]'),
 Text(398.5997161107168, 97.84800000000001, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(403.3520227111427, 97.84800000000001, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(405.72817601135563, 119.59199999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(412.8566359119944, 141.336, 'X[2] <= 0.164\ngini = 0.165\nsamples = 22\nvalue = [20,
2]'),
 Text(410.48048261178144, 119.59199999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(415.23278921220725, 119.59199999999998, 'gini = 0.091\nsamples = 21\nvalue = [20,
1]'),
 Text(412.8566359119944, 163.07999999999998, 'gini = 0.444\nsamples = 6\nvalue = [2, 4]'),
 Text(415.23278921220725, 228.312, 'X[4] <= 0.208\ngini = 0.255\nsamples = 40\nvalue = [3
4, 6]'),
 Text(412.8566359119944, 206.56799999999998, 'gini = 0.48\nsamples = 5\nvalue = [2, 3]'),
 Text(417.6089425124202, 206.56799999999998, 'X[3] <= 0.692\ngini = 0.157\nsamples = 35\nv
alue = [32, 3]'),
 Text(415.23278921220725, 184.824, 'gini = 0.062\nsamples = 31\nvalue = [30, 1]'),
 Text(419.9850958126331, 184.824, 'X[2] <= 0.269\ngini = 0.5\nsamples = 4\nvalue = [2,
2]'),
 Text(417.6089425124202, 163.07999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(422.361249112846, 163.07999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(422.361249112846, 250.05599999999998, 'X[4] <= 0.422\ngini = 0.245\nsamples = 7\nval
ue = [1, 6]'),
 Text(419.9850958126331, 228.312, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(424.73740241305893, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(434.2420156139106, 271.8, 'X[1] <= 0.654\ngini = 0.375\nsamples = 12\nvalue = [3,
9]'),
 Text(431.8658623136977, 250.05599999999998, 'X[1] <= 0.46\ngini = 0.375\nsamples = 4\nval
ue = [3, 1]'),
 Text(429.4897090134848, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(434.2420156139106, 228.312, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(436.61816891412354, 250.05599999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(469.2160220014195, 293.544, 'X[4] <= 0.367\ngini = 0.219\nsamples = 590\nvalue = [51
```

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6, 74]'),
 Text(447.31085876508166, 271.8, 'X[0] <= 0.577\ngini = 0.129\nsamples = 461\nvalue = [42
9, 32]'),
 Text(444.9347054648687, 250.05599999999998, 'X[1] <= 0.691\ngini = 0.355\nsamples = 52\nv
alue = [40, 12]'),
 Text(438.9943222143364, 228.312, 'X[0] <= 0.56\ngini = 0.273\nsamples = 43\nvalue = [36,
7]'),
 Text(436.61816891412354, 206.56799999999998, 'gini = 0.08\nsamples = 24\nvalue = [23,
1]'),
 Text(441.37047551454936, 206.56799999999998, 'X[0] <= 0.565\ngini = 0.432\nsamples = 19\n
value = [13, 6]'),
 Text(436.61816891412354, 184.824, 'X[2] <= 0.372\ngini = 0.5\nsamples = 10\nvalue = [5,
5]'),
 Text(434.2420156139106, 163.07999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(438.9943222143364, 163.07999999999998, 'X[0] <= 0.561\ngini = 0.408\nsamples = 7\nva
lue = [5, 2]'),
 Text(436.61816891412354, 141.336, 'gini = 0.444\nsamples = 3\nvalue = [1, 2]'),
 Text(441.37047551454936, 141.336, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(446.1227821149752, 184.824, 'X[0] <= 0.576\ngini = 0.198\nsamples = 9\nvalue = [8,
1]'),
 Text(443.7466288147623, 163.07999999999998, 'gini = 0.0\nsamples = 8\nvalue = [8, 0]'),
 Text(448.4989354151881, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(450.87508871540103, 228.312, 'X[2] <= 0.23\ngini = 0.494\nsamples = 9\nvalue = [4,
5]'),
 Text(448.4989354151881, 206.56799999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(453.25124201561397, 206.56799999999998, 'X[2] <= 0.573\ngini = 0.408\nsamples = 7\nv
alue = [2, 5]'),
 Text(450.87508871540103, 184.824, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(455.62739531582685, 184.824, 'gini = 0.444\nsamples = 3\nvalue = [2, 1]'),
 Text(449.6870120652946, 250.05599999999998, 'gini = 0.093\nsamples = 409\nvalue = [389, 2
0]'),
 Text(491.1211852377573, 271.8, 'X[0] <= 0.834\ngini = 0.439\nsamples = 129\nvalue = [87,
42]'),
 Text(477.90383250532295, 250.05599999999998, 'X[1] <= 0.566\ngini = 0.405\nsamples = 117
\nvalue = [84, 33]'),
 Text(467.50816181689146, 228.312, 'X[3] <= 0.621\ngini = 0.32\nsamples = 65\nvalue = [52,
13]'),
 Text(462.7558552164656, 206.56799999999998, 'X[0] <= 0.807\ngini = 0.226\nsamples = 54\nv
alue = [47, 7]'),
 Text(460.3797019162527, 184.824, 'gini = 0.15\nsamples = 49\nvalue = [45, 4]'),
 Text(465.1320085166785, 184.824, 'gini = 0.48\nsamples = 5\nvalue = [2, 3]'),
 Text(472.26046841731727, 206.56799999999998, 'X[2] <= 0.444\ngini = 0.496\nsamples = 11\n
value = [5, 6]'),
 Text(469.8843151171044, 184.824, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(474.6366217175302, 184.824, 'gini = 0.408\nsamples = 7\nvalue = [5, 2]'),
 Text(488.29950319375445, 228.312, 'X[0] <= 0.612\ngini = 0.473\nsamples = 52\nvalue = [3
2, 20]'),
 Text(481.76508161816895, 206.56799999999998, 'X[2] <= 0.813\ngini = 0.266\nsamples = 19\n
value = [16, 3]'),
 Text(479.388928317956, 184.824, 'X[1] <= 0.588\ngini = 0.198\nsamples = 18\nvalue = [16,
2]'),
 Text(477.01277501774314, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(481.76508161816895, 163.07999999999998, 'gini = 0.111\nsamples = 17\nvalue = [16,
1]'),
 Text(484.1412349183819, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(494.83392476934, 206.56799999999998, 'X[3] <= 0.519\ngini = 0.5\nsamples = 33\nvalue
= [16, 17]'),
 Text(488.8935415188077, 184.824, 'X[1] <= 0.598\ngini = 0.219\nsamples = 8\nvalue = [1,
7]'),
 Text(486.51738821859476, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(491.26969481902063, 163.07999999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
 Text(500.7743080198723, 184.824, 'X[2] <= 0.263\ngini = 0.48\nsamples = 25\nvalue = [15,
10]'),
 Text(496.02200141944644, 163.07999999999998, 'X[4] <= 0.406\ngini = 0.278\nsamples = 6\nv
alue = [1, 5]'),
 Text(493.64584811923356, 141.336, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
```

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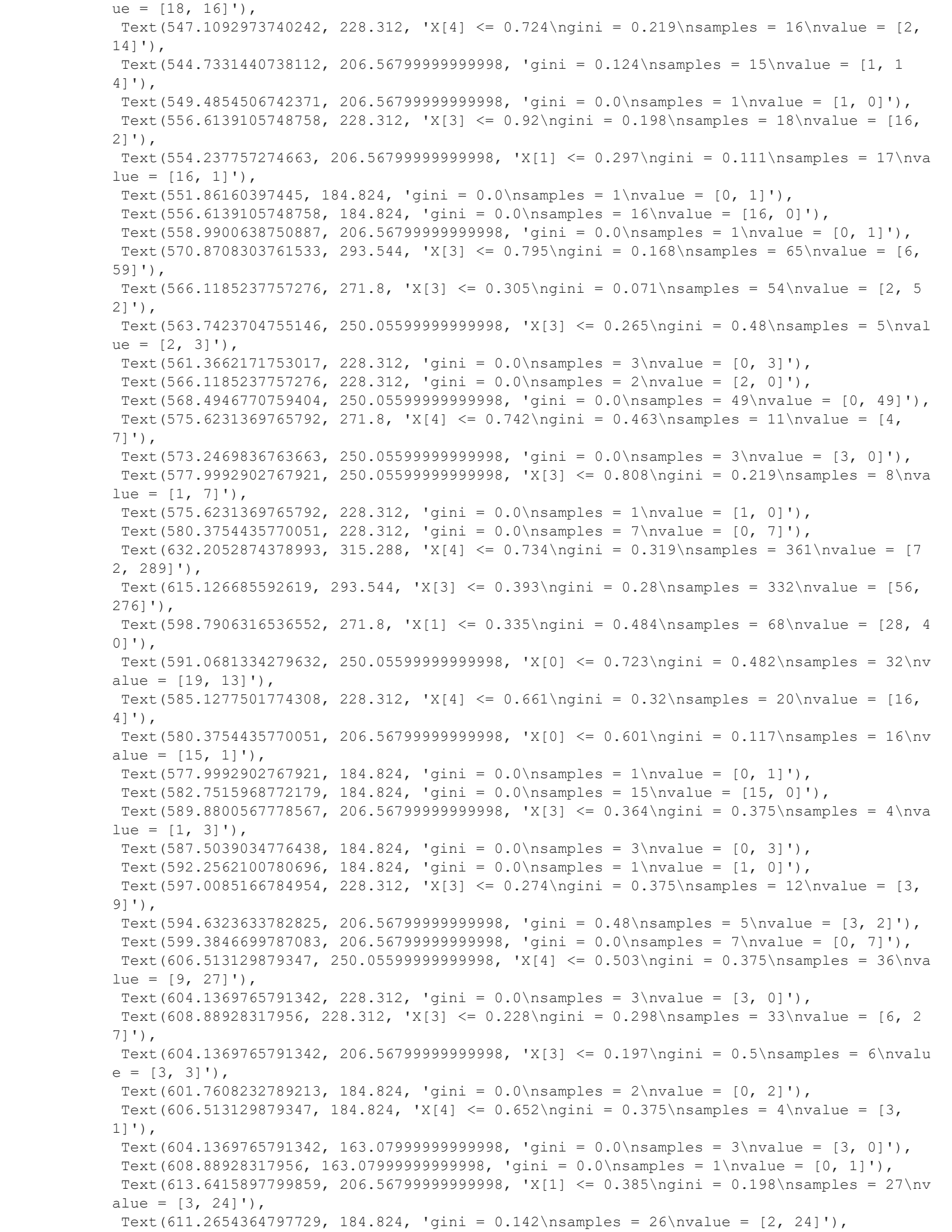
 Text(498.3981547196594, 141.336, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(505.5266146202981, 163.07999999999998, 'X[1] <= 0.62\ngini = 0.388\nsamples = 19\nva
lue = [14, 5]'),
 Text(503.1504613200852, 141.336, 'gini = 0.49\nsamples = 7\nvalue = [3, 4]'),
 Text(507.90276792051105, 141.336, 'gini = 0.153\nsamples = 12\nvalue = [11, 1]'),
 Text(504.3385379701917, 250.05599999999998, 'X[2] <= 0.661\ngini = 0.375\nsamples = 12\nv
alue = [3, 9]'),
 Text(501.96238466997875, 228.312, 'X[4] <= 0.422\ngini = 0.198\nsamples = 9\nvalue = [1,
8]'),
 Text(499.5862313697658, 206.56799999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(504.3385379701917, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(506.71469127040456, 228.312, 'gini = 0.444\nsamples = 3\nvalue = [2, 1]'),
 Text(666.2882363378283, 358.776, 'X[1] <= 0.386\ngini = 0.332\nsamples = 2599\nvalue = [5
47, 2052]'),
 Text(590.3255855216466, 337.032, 'X[0] <= 0.597\ngini = 0.473\nsamples = 677\nvalue = [26
0, 417]'),
 Text(548.445883605394, 315.288, 'X[4] <= 0.726\ngini = 0.482\nsamples = 316\nvalue = [18
8, 128]'),
 Text(526.0209368346345, 293.544, 'X[4] <= 0.492\ngini = 0.399\nsamples = 251\nvalue = [18
2, 69]'),
 Text(511.4669978708304, 271.8, 'X[3] <= 0.224\ngini = 0.498\nsamples = 47\nvalue = [22, 2
5]'),
 Text(509.0908445706175, 250.05599999999998, 'gini = 0.0\nsamples = 11\nvalue = [11, 0]'),
 Text(513.8431511710434, 250.05599999999998, 'X[3] <= 0.351\ngini = 0.424\nsamples = 36\nv
alue = [11, 25]'),
 Text(511.4669978708304, 228.312, 'gini = 0.499\nsamples = 19\nvalue = [9, 10]'),
 Text(516.2193044712562, 228.312, 'gini = 0.208\nsamples = 17\nvalue = [2, 15]'),
 Text(540.5748757984386, 271.8, 'X[4] <= 0.67\ngini = 0.338\nsamples = 204\nvalue = [160,
44]'),
 Text(529.2881476224273, 250.05599999999998, 'X[0] <= 0.586\ngini = 0.275\nsamples = 170\n
value = [142, 28]'),
 Text(520.9716110716821, 228.312, 'X[1] <= 0.362\ngini = 0.233\nsamples = 156\nvalue = [13
5, 21]'),
 Text(518.5954577714691, 206.56799999999998, 'gini = 0.147\nsamples = 113\nvalue = [104,
9]'),
 Text(523.347764371895, 206.56799999999998, 'X[0] <= 0.433\ngini = 0.402\nsamples = 43\nva
lue = [31, 12]'),
 Text(518.5954577714691, 184.824, 'X[2] <= 0.367\ngini = 0.32\nsamples = 5\nvalue = [1,
4]'),
 Text(516.2193044712562, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(520.9716110716821, 163.07999999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(528.1000709723209, 184.824, 'X[0] <= 0.54\ngini = 0.332\nsamples = 38\nvalue = [30,
8]'),
 Text(525.723917672108, 163.07999999999998, 'gini = 0.142\nsamples = 26\nvalue = [24,
2]'),
 Text(530.4762242725337, 163.07999999999998, 'X[2] <= 0.428\ngini = 0.5\nsamples = 12\nval
ue = [6, 6]'),
 Text(528.1000709723209, 141.336, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(532.8523775727467, 141.336, 'X[0] <= 0.566\ngini = 0.444\nsamples = 9\nvalue = [3,
6]'),
 Text(530.4762242725337, 119.59199999999998, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(535.2285308729596, 119.59199999999998, 'X[2] <= 0.502\ngini = 0.375\nsamples = 4\nva
lue = [3, 1]'),
 Text(532.8523775727467, 97.84800000000001, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(537.6046841731725, 97.84800000000001, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(537.6046841731725, 228.312, 'X[1] <= 0.338\ngini = 0.5\nsamples = 14\nvalue = [7,
7]'),
 Text(535.2285308729596, 206.56799999999998, 'X[2] <= 0.621\ngini = 0.42\nsamples = 10\nva
lue = [7, 3]'),
 Text(532.8523775727467, 184.824, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(537.6046841731725, 184.824, 'X[4] <= 0.663\ngini = 0.375\nsamples = 4\nvalue = [1,
3]'),
 Text(535.2285308729596, 163.07999999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(539.9808374733855, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(539.9808374733855, 206.56799999999998, 'gini = 0.0\nsamples = 4\nvalue = [0, 4]'),
 Text(551.86160397445, 250.05599999999998, 'X[3] <= 0.676\ngini = 0.498\nsamples = 34\nval
```


ue = [18, 16]'),
Text(547.1092973740242, 228.312, 'X[4] <= 0.724\ngini = 0.219\nsamples = 16\nvalue = [2, 14]'),
Text(544.7331440738112, 206.56799999999998, 'gini = 0.124\nsamples = 15\nvalue = [1, 14]'),
Text(549.4854506742371, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(556.6139105748758, 228.312, 'X[3] <= 0.92\ngini = 0.198\nsamples = 18\nvalue = [16, 2]'),
Text(554.237757274663, 206.56799999999998, 'X[1] <= 0.297\ngini = 0.111\nsamples = 17\nvalue = [16, 1]'),
Text(551.86160397445, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(556.6139105748758, 184.824, 'gini = 0.0\nsamples = 16\nvalue = [16, 0]'),
Text(558.9900638750887, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(570.8708303761533, 293.544, 'X[3] <= 0.795\ngini = 0.168\nsamples = 65\nvalue = [6, 59]'),
Text(566.1185237757276, 271.8, 'X[3] <= 0.305\ngini = 0.071\nsamples = 54\nvalue = [2, 52]'),
Text(563.7423704755146, 250.05599999999998, 'X[3] <= 0.265\ngini = 0.48\nsamples = 5\nvalue = [2, 3]'),
Text(561.3662171753017, 228.312, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(566.1185237757276, 228.312, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
Text(568.4946770759404, 250.05599999999998, 'gini = 0.0\nsamples = 49\nvalue = [0, 49]'),
Text(575.6231369765792, 271.8, 'X[4] <= 0.742\ngini = 0.463\nsamples = 11\nvalue = [4, 7]'),
Text(573.2469836763663, 250.05599999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(577.9992902767921, 250.05599999999998, 'X[3] <= 0.808\ngini = 0.219\nsamples = 8\nvalue = [1, 7]'),
Text(575.6231369765792, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(580.3754435770051, 228.312, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
Text(632.2052874378993, 315.288, 'X[4] <= 0.734\ngini = 0.319\nsamples = 361\nvalue = [72, 289]'),
Text(615.126685592619, 293.544, 'X[3] <= 0.393\ngini = 0.28\nsamples = 332\nvalue = [56, 276]'),
Text(598.7906316536552, 271.8, 'X[1] <= 0.335\ngini = 0.484\nsamples = 68\nvalue = [28, 40]'),
Text(591.0681334279632, 250.05599999999998, 'X[0] <= 0.723\ngini = 0.482\nsamples = 32\nvalue = [19, 13]'),
Text(585.1277501774308, 228.312, 'X[4] <= 0.661\ngini = 0.32\nsamples = 20\nvalue = [16, 4]'),
Text(580.3754435770051, 206.56799999999998, 'X[0] <= 0.601\ngini = 0.117\nsamples = 16\nvalue = [15, 1]'),
Text(577.9992902767921, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(582.7515968772179, 184.824, 'gini = 0.0\nsamples = 15\nvalue = [15, 0]'),
Text(589.8800567778567, 206.56799999999998, 'X[3] <= 0.364\ngini = 0.375\nsamples = 4\nvalue = [1, 3]'),
Text(587.5039034776438, 184.824, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
Text(592.2562100780696, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(597.0085166784954, 228.312, 'X[3] <= 0.274\ngini = 0.375\nsamples = 12\nvalue = [3, 9]'),
Text(594.6323633782825, 206.56799999999998, 'gini = 0.48\nsamples = 5\nvalue = [3, 2]'),
Text(599.3846699787083, 206.56799999999998, 'gini = 0.0\nsamples = 7\nvalue = [0, 7]'),
Text(606.513129879347, 250.05599999999998, 'X[4] <= 0.503\ngini = 0.375\nsamples = 36\nvalue = [9, 27]'),
Text(604.1369765791342, 228.312, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(608.88928317956, 228.312, 'X[3] <= 0.228\ngini = 0.298\nsamples = 33\nvalue = [6, 27]'),
Text(604.1369765791342, 206.56799999999998, 'X[3] <= 0.197\ngini = 0.5\nsamples = 6\nvalue = [3, 3]'),
Text(601.7608232789213, 184.824, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
Text(606.513129879347, 184.824, 'X[4] <= 0.652\ngini = 0.375\nsamples = 4\nvalue = [3, 1]'),
Text(604.1369765791342, 163.07999999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
Text(608.88928317956, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(613.6415897799859, 206.56799999999998, 'X[1] <= 0.385\ngini = 0.198\nsamples = 27\nvalue = [3, 24]'),
Text(611.2654364797729, 184.824, 'gini = 0.142\nsamples = 26\nvalue = [2, 24]'),

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 Text(616.0177430801988, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(631.4627395315828, 271.8, 'X[0] <= 0.652\ngini = 0.19\nsamples = 264\nvalue = [28, 2
36]'),
 Text(625.5223562810504, 250.05599999999998, 'X[1] <= 0.347\ngini = 0.408\nsamples = 70\nv
alue = [20, 50]'),
 Text(620.7700496806247, 228.312, 'X[4] <= 0.633\ngini = 0.483\nsamples = 44\nvalue = [18,
26]'),
 Text(618.3938963804117, 206.56799999999998, 'gini = 0.0\nsamples = 6\nvalue = [0, 6]'),
 Text(623.1462029808375, 206.56799999999998, 'X[4] <= 0.667\ngini = 0.499\nsamples = 38\nv
alue = [18, 20]'),
 Text(620.7700496806247, 184.824, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(625.5223562810504, 184.824, 'X[3] <= 0.545\ngini = 0.469\nsamples = 32\nvalue = [12,
20]'),
 Text(623.1462029808375, 163.07999999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(627.8985095812634, 163.07999999999998, 'X[2] <= 0.517\ngini = 0.5\nsamples = 24\nval
ue = [12, 12]'),
 Text(621.958126330731, 141.336, 'X[1] <= 0.334\ngini = 0.32\nsamples = 10\nvalue = [8,
2]'),
 Text(619.5819730305182, 119.59199999999998, 'gini = 0.198\nsamples = 9\nvalue = [8, 1]'),
 Text(624.334279630944, 119.59199999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(633.8388928317956, 141.336, 'X[4] <= 0.714\ngini = 0.408\nsamples = 14\nvalue = [4,
10]'),
 Text(629.0865862313698, 119.59199999999998, 'X[2] <= 0.809\ngini = 0.18\nsamples = 10\nva
lue = [1, 9]'),
 Text(626.7104329311569, 97.84800000000001, 'gini = 0.0\nsamples = 9\nvalue = [0, 9]'),
 Text(631.4627395315828, 97.84800000000001, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(638.5911994322215, 119.59199999999998, 'X[4] <= 0.727\ngini = 0.375\nsamples = 4\nva
lue = [3, 1]'),
 Text(636.2150461320085, 97.84800000000001, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(640.9673527324344, 97.84800000000001, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(630.2746628814763, 228.312, 'X[1] <= 0.385\ngini = 0.142\nsamples = 26\nvalue = [2,
24]'),
 Text(627.8985095812634, 206.56799999999998, 'gini = 0.077\nsamples = 25\nvalue = [1, 2
4]'),
 Text(632.6508161816892, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(637.403122782115, 250.05599999999998, 'X[4] <= 0.445\ngini = 0.079\nsamples = 194\nv
alue = [8, 186]'),
 Text(635.0269694819021, 228.312, 'gini = 0.444\nsamples = 3\nvalue = [2, 1]'),
 Text(639.7792760823279, 228.312, 'gini = 0.061\nsamples = 191\nvalue = [6, 185]'),
 Text(649.2838892831796, 293.544, 'X[0] <= 0.627\ngini = 0.495\nsamples = 29\nvalue = [16,
13]'),
 Text(644.5315826827538, 271.8, 'X[3] <= 0.785\ngini = 0.198\nsamples = 9\nvalue = [1,
8]'),
 Text(642.1554293825409, 250.05599999999998, 'gini = 0.0\nsamples = 8\nvalue = [0, 8]'),
 Text(646.9077359829666, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(654.0361958836055, 271.8, 'X[4] <= 0.769\ngini = 0.375\nsamples = 20\nvalue = [15,
5]'),
 Text(651.6600425833925, 250.05599999999998, 'X[2] <= 0.434\ngini = 0.496\nsamples = 11\nv
alue = [6, 5]'),
 Text(649.2838892831796, 228.312, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(654.0361958836055, 228.312, 'X[1] <= 0.31\ngini = 0.375\nsamples = 8\nvalue = [6,
2]'),
 Text(651.6600425833925, 206.56799999999998, 'gini = 0.444\nsamples = 3\nvalue = [1, 2]'),
 Text(656.4123491838184, 206.56799999999998, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(656.4123491838184, 250.05599999999998, 'gini = 0.0\nsamples = 9\nvalue = [9, 0]'),
 Text(742.25088715401, 337.032, 'X[4] <= 0.472\ngini = 0.254\nsamples = 1922\nvalue = [28
7, 1635]'),
 Text(693.5397444996452, 315.288, 'X[1] <= 0.66\ngini = 0.435\nsamples = 238\nvalue = [76,
162]'),
 Text(678.3917672107879, 293.544, 'X[0] <= 0.662\ngini = 0.473\nsamples = 172\nvalue = [6
6, 106]'),
 Text(665.91696238467, 271.8, 'X[3] <= 0.442\ngini = 0.499\nsamples = 92\nvalue = [48, 4
4]'),
 Text(663.5408090844571, 250.05599999999998, 'gini = 0.337\nsamples = 28\nvalue = [22,
6]'),
 Text(668.293115684883, 250.05599999999998, 'X[1] <= 0.631\ngini = 0.482\nsamples = 64\nva
```

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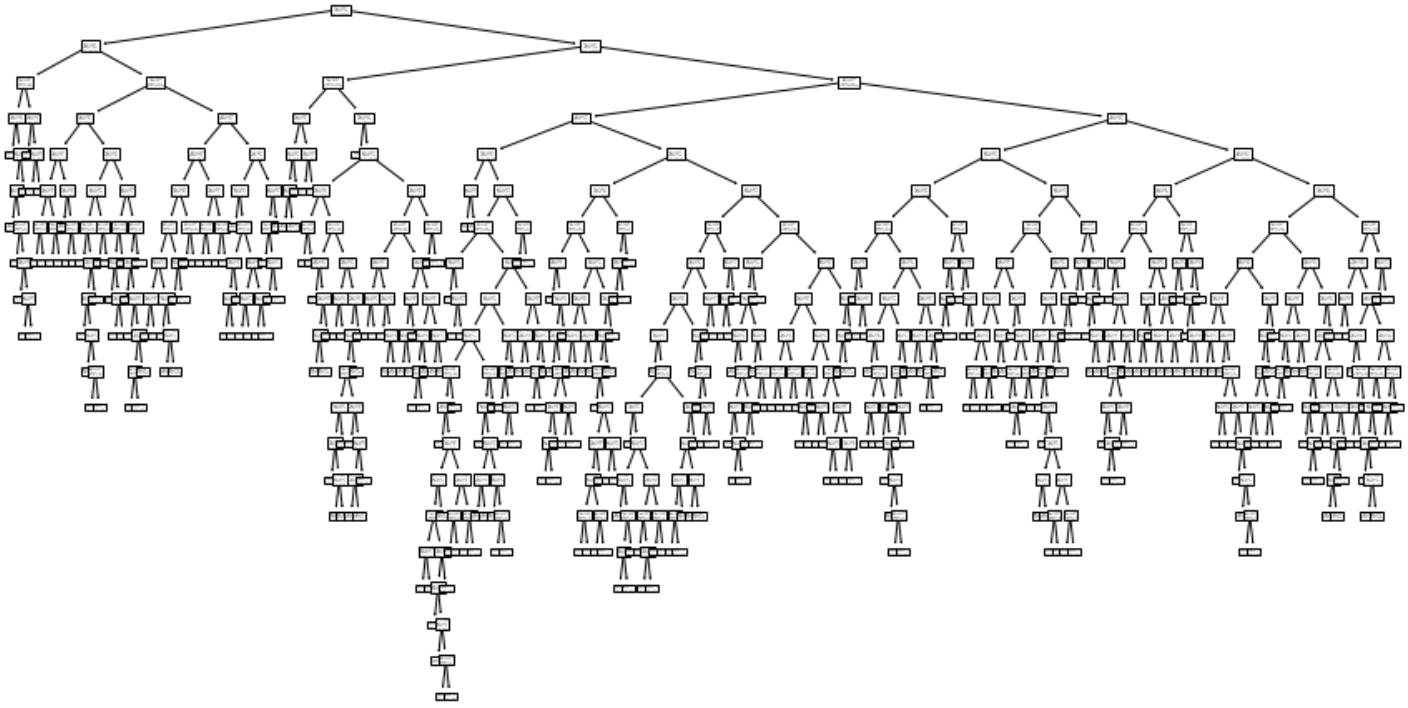
lue = [26, 38]'),
 Text(663.5408090844571, 228.312, 'X[0] <= 0.466\ngini = 0.448\nsamples = 56\nvalue = [19,
37]'),
 Text(661.1646557842442, 206.56799999999998, 'gini = 0.1\nsamples = 19\nvalue = [1, 18]'),
 Text(665.91696238467, 206.56799999999998, 'X[1] <= 0.57\ngini = 0.5\nsamples = 37\nvalue
= [18, 19]'),
 Text(661.1646557842442, 184.824, 'X[3] <= 0.465\ngini = 0.469\nsamples = 24\nvalue = [15,
9]'),
 Text(658.7885024840313, 163.07999999999998, 'gini = 0.245\nsamples = 7\nvalue = [1, 6]'),
 Text(663.5408090844571, 163.07999999999998, 'X[4] <= 0.431\ngini = 0.291\nsamples = 17\nv
alue = [14, 3]'),
 Text(661.1646557842442, 141.336, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(665.91696238467, 141.336, 'gini = 0.219\nsamples = 16\nvalue = [14, 2]'),
 Text(670.6692689850959, 184.824, 'X[0] <= 0.532\ngini = 0.355\nsamples = 13\nvalue = [3,
10]'),
 Text(668.293115684883, 163.07999999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(673.0454222853087, 163.07999999999998, 'gini = 0.165\nsamples = 11\nvalue = [1, 1
0]'),
 Text(673.0454222853087, 228.312, 'X[4] <= 0.428\ngini = 0.219\nsamples = 8\nvalue = [7,
1]'),
 Text(670.6692689850959, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(675.4215755855217, 206.56799999999998, 'gini = 0.0\nsamples = 7\nvalue = [7, 0]'),
 Text(690.8665720369056, 271.8, 'X[1] <= 0.423\ngini = 0.349\nsamples = 80\nvalue = [18, 6
2]'),
 Text(684.9261887863734, 250.05599999999998, 'X[4] <= 0.452\ngini = 0.469\nsamples = 8\nva
lue = [5, 3]'),
 Text(682.5500354861605, 228.312, 'X[0] <= 0.762\ngini = 0.375\nsamples = 4\nvalue = [1,
3]'),
 Text(680.1738821859475, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(684.9261887863734, 206.56799999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(687.3023420865862, 228.312, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(696.806955287438, 250.05599999999998, 'X[4] <= 0.45\ngini = 0.296\nsamples = 72\nval
ue = [13, 59]'),
 Text(692.0546486870121, 228.312, 'X[2] <= 0.22\ngini = 0.424\nsamples = 36\nvalue = [11,
25]'),
 Text(689.6784953867992, 206.56799999999998, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(694.430801987225, 206.56799999999998, 'gini = 0.389\nsamples = 34\nvalue = [9, 2
5]'),
 Text(701.5592618878638, 228.312, 'X[4] <= 0.472\ngini = 0.105\nsamples = 36\nvalue = [2,
34]'),
 Text(699.1831085876508, 206.56799999999998, 'gini = 0.056\nsamples = 35\nvalue = [1, 3
4]'),
 Text(703.9354151880767, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(708.6877217885026, 293.544, 'X[4] <= 0.43\ngini = 0.257\nsamples = 66\nvalue = [10,
56]'),
 Text(703.9354151880767, 271.8, 'X[1] <= 0.689\ngini = 0.5\nsamples = 6\nvalue = [3, 3]'),
 Text(701.5592618878638, 250.05599999999998, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(706.3115684882896, 250.05599999999998, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(713.4400283889283, 271.8, 'X[4] <= 0.472\ngini = 0.206\nsamples = 60\nvalue = [7, 5
3]'),
 Text(711.0638750887155, 250.05599999999998, 'X[2] <= 0.125\ngini = 0.183\nsamples = 59\nv
alue = [6, 53]'),
 Text(708.6877217885026, 228.312, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(713.4400283889283, 228.312, 'X[0] <= 0.779\ngini = 0.158\nsamples = 58\nvalue = [5,
53]'),
 Text(711.0638750887155, 206.56799999999998, 'gini = 0.131\nsamples = 57\nvalue = [4, 5
3]'),
 Text(715.8161816891413, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(715.8161816891413, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(790.9620298083748, 315.288, 'X[0] <= 0.527\ngini = 0.219\nsamples = 1684\nvalue = [2
11, 1473]'),
 Text(763.042228530873, 293.544, 'X[1] <= 0.476\ngini = 0.329\nsamples = 573\nvalue = [11
9, 454]'),
 Text(743.1419446415898, 271.8, 'X[4] <= 0.667\ngini = 0.494\nsamples = 150\nvalue = [67,
83]'),
 Text(727.6969481902058, 250.05599999999998, 'X[3] <= 0.361\ngini = 0.407\nsamples = 81\nv
```

```
alue = [58, 23]'),
 Text(722.9446415897801, 228.312, 'X[2] <= 0.16\ngini = 0.121\nsamples = 31\nvalue = [29,
2]'),
 Text(720.5684882895671, 206.56799999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(725.320794889993, 206.56799999999998, 'gini = 0.064\nsamples = 30\nvalue = [29,
1]'),
 Text(732.4492547906317, 228.312, 'X[4] <= 0.576\ngini = 0.487\nsamples = 50\nvalue = [29,
21]'),
 Text(730.0731014904188, 206.56799999999998, 'gini = 0.18\nsamples = 10\nvalue = [1, 9]'),
 Text(734.8254080908446, 206.56799999999998, 'X[2] <= 0.475\ngini = 0.42\nsamples = 40\nva
lue = [28, 12]'),
 Text(730.0731014904188, 184.824, 'X[3] <= 0.833\ngini = 0.117\nsamples = 16\nvalue = [15,
1]'),
 Text(727.6969481902058, 163.07999999999998, 'gini = 0.0\nsamples = 15\nvalue = [15, 0]'),
 Text(732.4492547906317, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(739.5777146912704, 184.824, 'X[1] <= 0.411\ngini = 0.497\nsamples = 24\nvalue = [13,
11]'),
 Text(737.2015613910576, 163.07999999999998, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(741.9538679914834, 163.07999999999998, 'X[0] <= 0.441\ngini = 0.488\nsamples = 19\nv
alue = [8, 11]'),
 Text(739.5777146912704, 141.336, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(744.3300212916963, 141.336, 'X[3] <= 0.53\ngini = 0.391\nsamples = 15\nvalue = [4, 1
1]'),
 Text(741.9538679914834, 119.59199999999998, 'gini = 0.0\nsamples = 9\nvalue = [0, 9]'),
 Text(746.7061745919092, 119.59199999999998, 'X[3] <= 0.654\ngini = 0.444\nsamples = 6\nva
lue = [4, 2]'),
 Text(744.3300212916963, 97.84800000000001, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(749.0823278921222, 97.84800000000001, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(758.5869410929738, 250.05599999999998, 'X[3] <= 0.897\ngini = 0.227\nsamples = 69\nv
alue = [9, 60]'),
 Text(756.2107877927609, 228.312, 'X[4] <= 0.707\ngini = 0.165\nsamples = 66\nvalue = [6,
60]'),
 Text(753.8346344925479, 206.56799999999998, 'X[3] <= 0.595\ngini = 0.386\nsamples = 23\nv
alue = [6, 17]'),
 Text(749.0823278921222, 184.824, 'X[3] <= 0.336\ngini = 0.117\nsamples = 16\nvalue = [1,
15]'),
 Text(746.7061745919092, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(751.4584811923351, 163.07999999999998, 'gini = 0.0\nsamples = 15\nvalue = [0, 15]'),
 Text(758.5869410929738, 184.824, 'X[2] <= 0.287\ngini = 0.408\nsamples = 7\nvalue = [5,
2]'),
 Text(756.2107877927609, 163.07999999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(760.9630943931867, 163.07999999999998, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(758.5869410929738, 206.56799999999998, 'gini = 0.0\nsamples = 43\nvalue = [0, 43]'),
 Text(760.9630943931867, 228.312, 'gini = 0.0\nsamples = 3\nvalue = [3, 0]'),
 Text(782.9425124201562, 271.8, 'X[4] <= 0.496\ngini = 0.216\nsamples = 423\nvalue = [52,
371]'),
 Text(772.8438608942513, 250.05599999999998, 'X[1] <= 0.628\ngini = 0.459\nsamples = 28\nv
alue = [10, 18]'),
 Text(768.0915542938254, 228.312, 'X[3] <= 0.562\ngini = 0.444\nsamples = 9\nvalue = [6,
3]'),
 Text(765.7154009936125, 206.56799999999998, 'X[2] <= 0.249\ngini = 0.245\nsamples = 7\nva
lue = [6, 1]'),
 Text(763.3392476933997, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(768.0915542938254, 184.824, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(770.4677075940384, 206.56799999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(777.5961674946772, 228.312, 'X[3] <= 0.536\ngini = 0.332\nsamples = 19\nvalue = [4,
15]'),
 Text(775.2200141944642, 206.56799999999998, 'gini = 0.133\nsamples = 14\nvalue = [1, 1
3]'),
 Text(779.97232079489, 206.56799999999998, 'gini = 0.48\nsamples = 5\nvalue = [3, 2]'),
 Text(793.0411639460611, 250.05599999999998, 'X[0] <= 0.527\ngini = 0.19\nsamples = 395\nv
alue = [42, 353]'),
 Text(790.6650106458482, 228.312, 'X[0] <= 0.412\ngini = 0.183\nsamples = 393\nvalue = [4
0, 353]'),
 Text(784.7246273953159, 206.56799999999998, 'X[3] <= 0.451\ngini = 0.473\nsamples = 13\nv
alue = [5, 8]'),
```

```
 Text(782.348474095103, 184.824, 'X[1] <= 0.679\ngini = 0.469\nsamples = 8\nvalue = [5,
3]'),
 Text(779.97232079489, 163.07999999999998, 'gini = 0.0\nsamples = 4\nvalue = [4, 0]'),
 Text(784.7246273953159, 163.07999999999998, 'X[4] <= 0.582\ngini = 0.375\nsamples = 4\nva
lue = [1, 3]'),
 Text(782.348474095103, 141.336, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(787.1007806955288, 141.336, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(787.1007806955288, 184.824, 'gini = 0.0\nsamples = 5\nvalue = [0, 5]'),
 Text(796.6053938963805, 206.56799999999998, 'X[2] <= 0.267\ngini = 0.167\nsamples = 380\n
value = [35, 345]'),
 Text(791.8530872959547, 184.824, 'X[2] <= 0.242\ngini = 0.391\nsamples = 30\nvalue = [8,
22]'),
 Text(789.4769339957418, 163.07999999999998, 'gini = 0.278\nsamples = 24\nvalue = [4, 2
0]'),
 Text(794.2292405961675, 163.07999999999998, 'gini = 0.444\nsamples = 6\nvalue = [4, 2]'),
 Text(801.3577004968063, 184.824, 'X[1] <= 0.494\ngini = 0.142\nsamples = 350\nvalue = [2
7, 323]'),
 Text(798.9815471965934, 163.07999999999998, 'X[3] <= 0.335\ngini = 0.326\nsamples = 39\nv
alue = [8, 31]'),
 Text(796.6053938963805, 141.336, 'X[4] <= 0.634\ngini = 0.375\nsamples = 8\nvalue = [6,
2]'),
 Text(794.2292405961675, 119.59199999999998, 'gini = 0.0\nsamples = 6\nvalue = [6, 0]'),
 Text(798.9815471965934, 119.59199999999998, 'gini = 0.0\nsamples = 2\nvalue = [0, 2]'),
 Text(801.3577004968063, 141.336, 'gini = 0.121\nsamples = 31\nvalue = [2, 29]'),
 Text(803.7338537970193, 163.07999999999998, 'gini = 0.115\nsamples = 311\nvalue = [19, 29
2]'),
 Text(795.417317246274, 228.312, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(818.8818310858766, 293.544, 'X[4] <= 0.794\ngini = 0.152\nsamples = 1111\nvalue = [9
2, 1019]'),
 Text(811.4563520227113, 271.8, 'X[3] <= 0.116\ngini = 0.145\nsamples = 1105\nvalue = [87,
1018]'),
 Text(803.7338537970193, 250.05599999999998, 'X[2] <= 0.474\ngini = 0.496\nsamples = 11\nv
alue = [5, 6]'),
 Text(801.3577004968063, 228.312, 'gini = 0.0\nsamples = 3\nvalue = [0, 3]'),
 Text(806.1100070972321, 228.312, 'gini = 0.469\nsamples = 8\nvalue = [5, 3]'),
 Text(819.1788502484031, 250.05599999999998, 'X[4] <= 0.505\ngini = 0.139\nsamples = 1094
\nvalue = [82, 1012]'),
 Text(810.862313697658, 228.312, 'X[1] <= 0.401\ngini = 0.244\nsamples = 169\nvalue = [24,
145]'),
 Text(808.486160397445, 206.56799999999998, 'gini = 0.444\nsamples = 3\nvalue = [2, 1]'),
 Text(813.2384669978709, 206.56799999999998, 'X[0] <= 0.877\ngini = 0.23\nsamples = 166\nv
alue = [22, 144]'),
 Text(810.862313697658, 184.824, 'X[4] <= 0.505\ngini = 0.222\nsamples = 165\nvalue = [21,
144]'),
 Text(808.486160397445, 163.07999999999998, 'gini = 0.214\nsamples = 164\nvalue = [20, 14
4]'),
 Text(813.2384669978709, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(815.6146202980838, 184.824, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(827.4953867991484, 228.312, 'X[1] <= 0.695\ngini = 0.118\nsamples = 925\nvalue = [5
8, 867]'),
 Text(822.7430801987225, 206.56799999999998, 'X[0] <= 0.612\ngini = 0.108\nsamples = 904\n
value = [52, 852]'),
 Text(820.3669268985096, 184.824, 'X[1] <= 0.472\ngini = 0.153\nsamples = 478\nvalue = [4
0, 438]'),
 Text(817.9907735982968, 163.07999999999998, 'X[4] <= 0.531\ngini = 0.284\nsamples = 140\n
value = [24, 116]'),
 Text(815.6146202980838, 141.336, 'gini = 0.0\nsamples = 2\nvalue = [2, 0]'),
 Text(820.3669268985096, 141.336, 'X[3] <= 0.728\ngini = 0.268\nsamples = 138\nvalue = [2
2, 116]'),
 Text(817.9907735982968, 119.59199999999998, 'gini = 0.225\nsamples = 124\nvalue = [16, 10
8]'),
 Text(822.7430801987225, 119.59199999999998, 'gini = 0.49\nsamples = 14\nvalue = [6, 8]'),
 Text(822.7430801987225, 163.07999999999998, 'gini = 0.09\nsamples = 338\nvalue = [16, 32
2]'),
 Text(825.1192334989355, 184.824, 'gini = 0.055\nsamples = 426\nvalue = [12, 414]'),
 Text(832.2476933995742, 206.56799999999998, 'X[0] <= 0.603\ngini = 0.408\nsamples = 21\nv
```

```
alue = [6, 15]'),
 Text(829.8715400993614, 184.824, 'X[2] <= 0.245\ngini = 0.117\nsamples = 16\nvalue = [1,
15]'),
 Text(827.4953867991484, 163.07999999999998, 'gini = 0.0\nsamples = 1\nvalue = [1, 0]'),
 Text(832.2476933995742, 163.07999999999998, 'gini = 0.0\nsamples = 15\nvalue = [0, 15]'),
 Text(834.6238466997871, 184.824, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]'),
 Text(826.307310149042, 271.8, 'X[0] <= 0.572\ngini = 0.278\nsamples = 6\nvalue = [5,
1]'),
 Text(823.931156848829, 250.05599999999998, 'gini = 0.0\nsamples = 1\nvalue = [0, 1]'),
 Text(828.6834634492549, 250.05599999999998, 'gini = 0.0\nsamples = 5\nvalue = [5, 0]')]
```



In [146…

```
dotfile = open("data/tree_max_leaf_nodes.dot", 'w')
tree.export_graphviz(clf6, out_file = dotfile, feature_names = xtrain.columns)
dotfile.close()
```

In [53]:

```
ypred6 = clf6.predict(xtest)
```

In [54]:

```
scores6 = cross_val_score(clf6, xtrain, ytrain, cv=5)
scores6
```

Out[54]:

```
array([0.84408602, 0.83064516, 0.8313172 , 0.83860121, 0.83523874])
```

In [55]:

```
print("%0.4f accuracy with a standard deviation of %0.4f" % (scores6.mean(), scores6.std()
```

```
0.8360 accuracy with a standard deviation of 0.0050
```

In [56]:

```
hyperparameters = hyperparameters.append({'hyperparameters':'max_leaf_nodes', 'accuracy':
```

Finálna úspešnosť všetkých nami zvolených kombinácií hyperparametrov vyzerá nasledovne:

In [57]:

```
hyperparameters
```

Out[57]:

	hyperparameters	accuracy
0	max_depth	0.835037

	hyperparameters	accuracy
1	gini	0.803440
2	max_depth + gini	0.835305
3	entropy	0.817023
4	max_depth + entropy	0.841759
5	max_leaf_nodes	0.835978

Najúspešnejší rozhodovací strom mal kombináciu hyperparametrov *max_depth* a *entropy*, dosiahol accuracy 84.17%:

In [58]:
```
hyperparameters[hyperparameters['accuracy']==hyperparameters['accuracy'].max()]
```

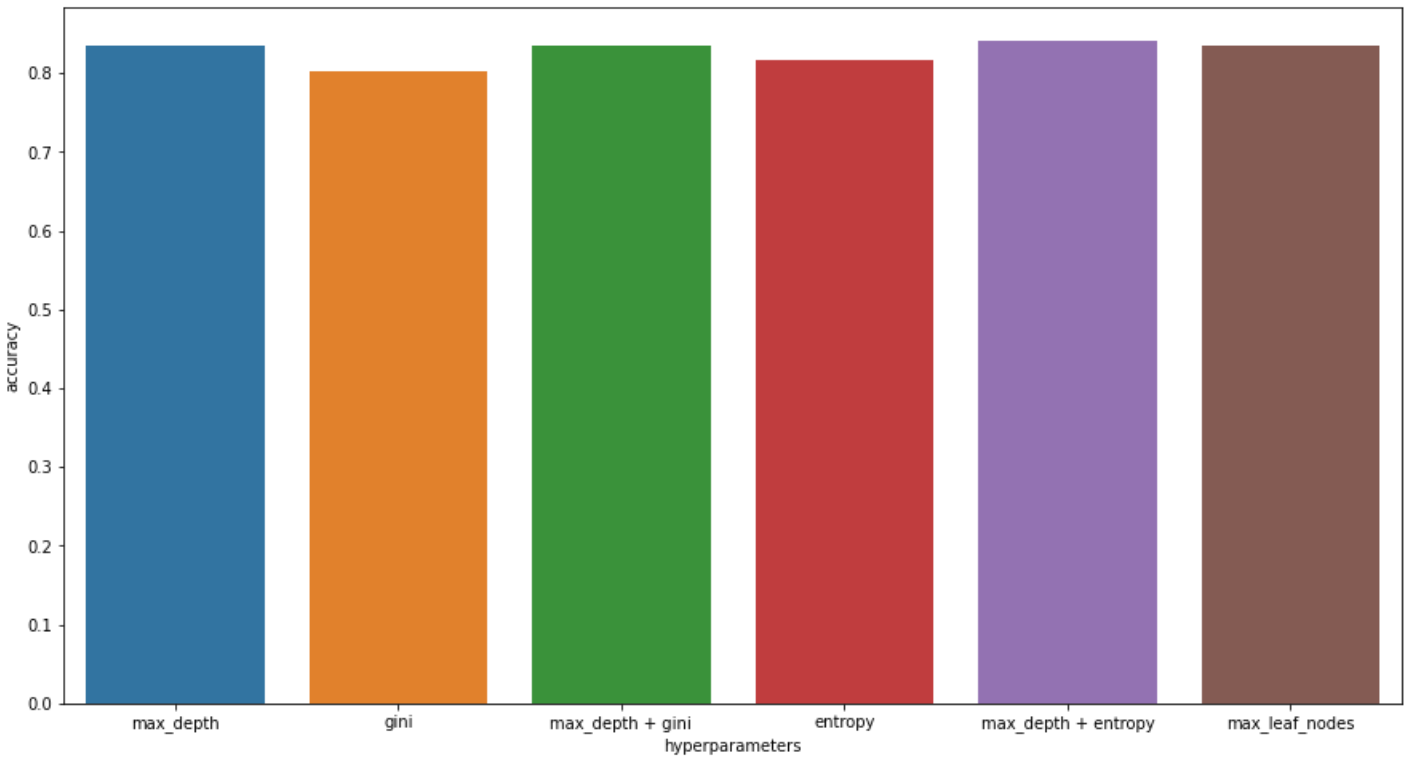
Out[58]:

	hyperparameters	accuracy
4	max_depth + entropy	0.841759

Porovnanie nami navrhnutých hyperparametrov a úspešnosť rozhodovacích stromov s danými hyperparametrami:

In [59]:
```
plt.figure(figsize=(15,8))
sns.barplot(data=hyperparameters, x=hyperparameters.hyperparameters, y=hyperparameters.acc
```

Out[59]:
```
<AxesSubplot:xlabel='hyperparameters', ylabel='accuracy'>
```



Gridsearch

Pre optimálne zvolenie hyperparametrov klasifikačných algoritmov je vhodné použiť grid search. Ten prejde všetky kombinácie nami zadaných parametrov, pre kazdú kombináciu zistí accuracy a vráti nám najlepšiu kombináciu pre klasifikáciu dát s použitím daného algoritmu. Na grid search používame funckiu GridSearchCV()

z knižnice sklearn, ktorej sme pridali parameter *cv* na využitie 5-násobnej cross-validation na nájdenie najlepšieho skóre danej kombinácie hyperparametrov.

Pomocou grid search sme optimalizovali parametre pre 2 klasifikačné algoritmy: **C-Support Vector klasifikátor** a **decision tree klasifikátor**

SVC a grid search

Pre SVC algoritmus hľadáme najlepšiu kombináciu hyperparametrov kernel (linear alebo rbf) a C (1 alebo 10).

In [60]:
```
estimator = svm.SVC()
parameters = {'kernel':('linear', 'rbf'),
              'C':[1, 10]}
scoring = ['accuracy',
           'precision_micro']

clf = GridSearchCV(estimator=estimator,
                   param_grid=parameters,
                   cv=5,
                   scoring=scoring,
                   refit='accuracy')
grid1 = clf.fit(xtrain.values, ytrain.values.flatten())

print(grid1.best_estimator_)
print(grid1.best_score_)
print(grid1.best_params_)
```

```
SVC(C=10)
0.8763116363320824
{'C': 10, 'kernel': 'rbf'}
```

Natrénovaný model SVC klasifikátora s najlepšími hyperparametrami spustíme na testovacej množine dát a zistíme jeho accuracy, precision a recall.

In [61]:
```
ypred7 = grid1.best_estimator_.predict(xtest)
```

```
c:\users\jakub\appdata\local\programs\python\python38\lib\site-packages\sklearn\base.py:43
4: UserWarning: X has feature names, but SVC was fitted without feature names
  warnings.warn(
```

In [62]:
```
acc = metrics.accuracy_score(ytest, ypred7)
print("Accuracy :", acc * 100, '%')
```

```
Accuracy : 86.69354838709677 %
```

In [63]:
```
prec = metrics.precision_score(ytest, ypred7)
print("Precision :", prec * 100, '%')
```

```
Precision : 86.3139735480161 %
```

In [64]:
```
rec = metrics.recall_score(ytest, ypred7)
print("Recall :", rec * 100, '%')
```

```
Recall : 94.22473320778406 %
```

In [65]:
```
s = ""
for key,value in grid1.best_params_.items():
     s += f"{key}:{value},"
s = s[:len(s)-1]
```

In [66]:
```
algorithm_accuracy = algorithm_accuracy.append({'algorithm':'svc grid search', 'hyperparar
```

Decision tree grid search

V prvje časti tejto podkapitoly sme námatkovo skúšali rôzne kombinácie hyperparametrov pre rozhodovací strom. Aby sme však našli tú najúspešnejšiu kombináciu, teraz použijeme grid search na prehľadanie všetkých nami zvolených kombinácií hyperparametrov.

Hodnoty pre konkrétne hyperparametre sme zvolili na základe predošlého skúšania rôznych hodnôt. Kvôli nedostačujúcej výpočtovej technike našich strojov nebolo možné vyskúšať viaceré kombinácie s väčším rozsahom hodnôt. Pozrieme sa teda na kombinácie hyperparametrov:

- *criterion* - hodnota "entropy" alebo "gini", čo robia je vysvetlené v predošlej sekcii
- *max_depth* - čo robí je vysvetlené v predošlej sekcii
- *max_leaf_nodes* - čo robí je vysvetlené v predošlej sekcii
- *min_samples_split* - element stromu musí mať minimálne toľko samples ako je hodnota tohto parametra na to, aby mohol byť rozdelený na 2 child elementy
- *min_samples_leaf* - rozhodovací strom musí mať v liste aspoň toľko samples, ako je hodnota tohto parametra

In [67]:
```
decision_tree = tree.DecisionTreeClassifier()
params = {
    "criterion":['entropy', 'gini'],
    "max_depth":[5,8,11,14],
    "max_leaf_nodes": [50,100,200,300],
    "min_samples_split":[5,8,11,14],
    "min_samples_leaf":[5,8,11,14],
    "max_features":[2,3,4,5]
}
grid2 = GridSearchCV(decision_tree, param_grid=params, cv=5, verbose=1)
grid2.fit(xtrain, ytrain)
```

Out[67]:
```
Fitting 5 folds for each of 2048 candidates, totalling 10240 fits
GridSearchCV(cv=5, estimator=DecisionTreeClassifier(),
             param_grid={'criterion': ['entropy', 'gini'],
                         'max_depth': [5, 8, 11, 14],
                         'max_features': [2, 3, 4, 5],
                         'max_leaf_nodes': [50, 100, 200, 300],
                         'min_samples_leaf': [5, 8, 11, 14],
                         'min_samples_split': [5, 8, 11, 14]},
             verbose=1)
```

Najlepšia kombinácia hyperparametrov a ich hodnoty:

In [68]:
```
grid2.best_params_
```

Out[68]:
```
{'criterion': 'gini',
 'max_depth': 11,
 'max_features': 4,
 'max_leaf_nodes': 100,
 'min_samples_leaf': 8,
 'min_samples_split': 14}
```

In [69]:
```
grid2.best_estimator_
```

Out[69]:
```
DecisionTreeClassifier(max_depth=11, max_features=4, max_leaf_nodes=100,
                       min_samples_leaf=8, min_samples_split=14)
```

Úspešnosť modelu rozhodovacieho stromu s najlepšou kombináciou hyperparametrov podľa grid search:

In [70]:
```
grid2.best_score_
```

Out[70]:
```
0.8484807398890745
```

In [71]:
```
results = []
estimators = []
for i in range(1, xtrain.shape[1] + 1):
    row = {'model_complexity': i}

    # Vytvoríme rozhodovací strom
    # strom s maximalnou hlbkou 1-pocet atributov,  simulujeme tak zlozitost modelu
    clf = tree.DecisionTreeClassifier(max_depth = i, criterion='gini', max_features=4, max
                      min_samples_leaf=8, min_samples_split=11)

    # natrenovanie modelu a predikovanie na trenovacej sade
    pred = clf.fit(xtrain, ytrain).predict(xtrain)

    # chyba na trenovacej sade
    row['train'] = 1-metrics.accuracy_score(ytrain, pred)

    # predickcia
    pred = clf.predict(xtest)

    # chyba na testovacej sade
    row['test'] = 1-metrics.accuracy_score(ytest, pred)
    results.append(row)
    estimators.append(clf)
```

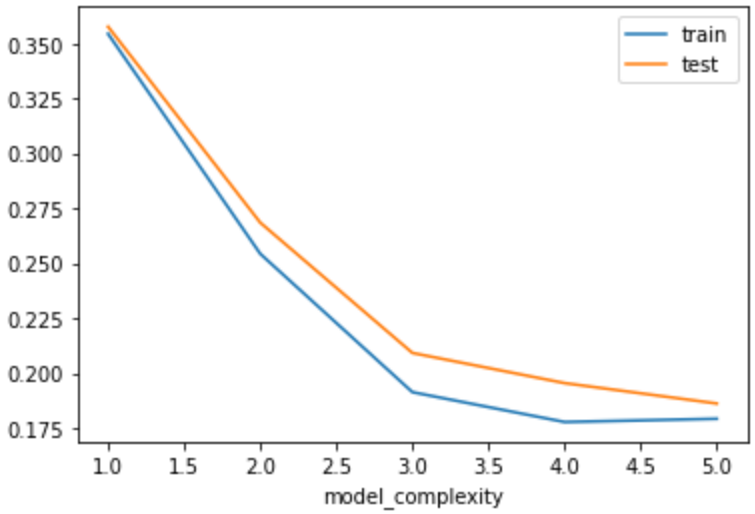
In [72]:
```
complexity_df = pd.DataFrame(results)
complexity_df
```

Out[72]:

	model_complexity	train	test
0	1	0.354396	0.357661
1	2	0.254369	0.268548
2	3	0.191449	0.209274
3	4	0.177870	0.195565
4	5	0.179349	0.186290

In [73]:
```
complexity_df.plot(x='model_complexity')
```

Out[73]:
```
<AxesSubplot:xlabel='model_complexity'>
```



S rastúcou zložitosťou modelu klesá chyba na trénovanej vzorke spolu s chybou na testovacej. Toto je indikátor toho, že sme model nepreučili a tento model dostatočne zovšeobecňuje vzory v dátach.

Natrénovaný model rozhodovacieho stromu s najlepšími hyperparametrami teda môžeme spustiť na testovacej množine dát a zistíme jeho accuracy, precision a recall.

In [74]:
```
ypred8 = grid2.best_estimator_.predict(xtest)
```

In [75]:
```
acc = metrics.accuracy_score(ytest, ypred8)
print("Accuracy :", acc * 100, '%')
```

```
Accuracy : 82.94354838709678 %
```

In [76]:
```
prec = metrics.precision_score(ytest, ypred8)
print("Precision :", prec * 100, '%')
```

```
Precision : 83.73702422145328 %
```

In [77]:
```
rec = metrics.recall_score(ytest, ypred8)
print("Recall :", rec * 100, '%')
```

```
Recall : 91.1487758945386 %
```

In [78]:
```
s = ""
for key,value in grid2.best_params_.items():
     s += f"{key}:{value},"
s = s[:len(s)-1]
```

In [79]:
```
algorithm_accuracy = algorithm_accuracy.append({'algorithm':'decision tree grid search', '
```

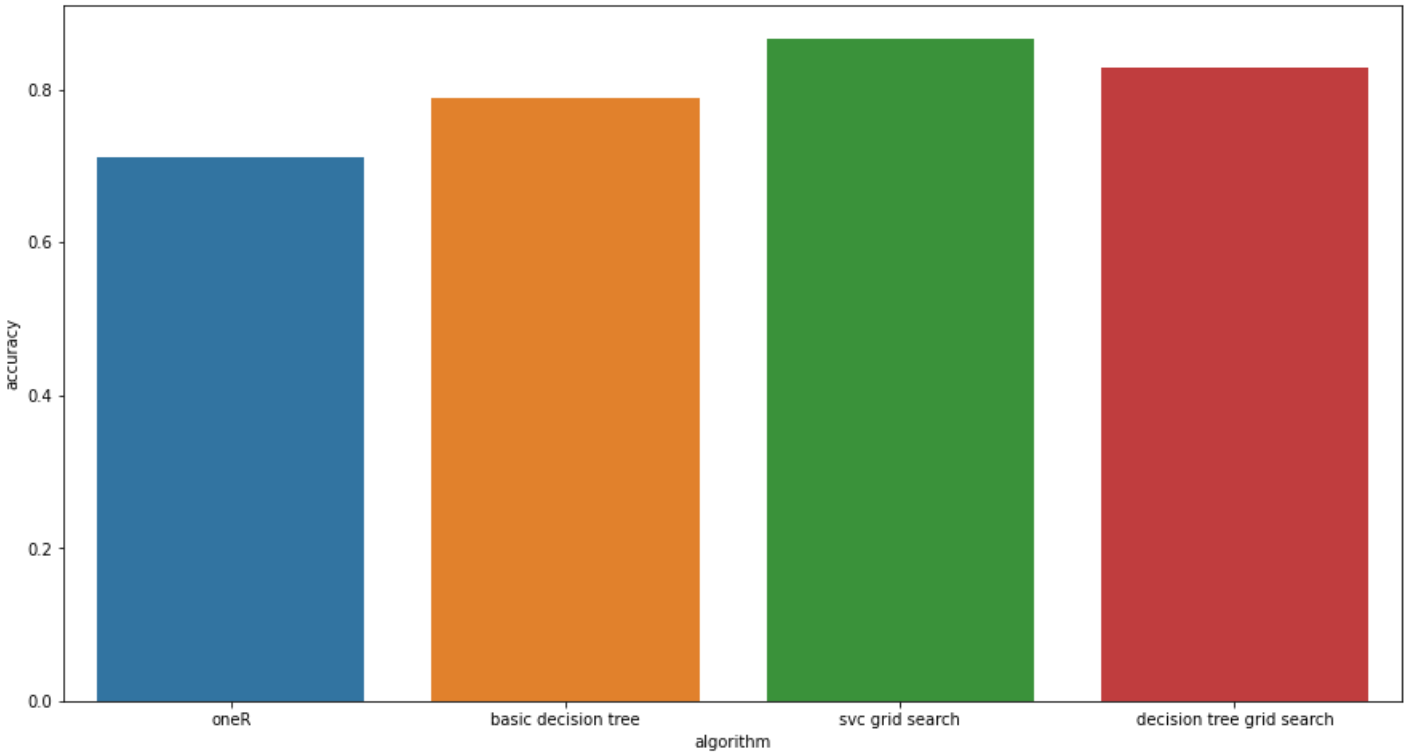
Porovnanie úspešností nami vyskúšaných algoritmov

Budeme porovnávať accuracy, recall a precision algoritmov:

- **nami vytvorený oneR algoritmus**
- **decision tree s predvolenými hodnotami hyperparametrov**
- **SVC s hyperparametrami optimalizovanými cez grid search**
- **decision tree s hyperparametrami optimalizovanými cez grid search**

In [80]:
```
plt.figure(figsize=(15,8))
sns.barplot(data=algorithm_accuracy, x=algorithm_accuracy.algorithm, y=algorithm_accuracy.
```

Out[80]:
```
<AxesSubplot:xlabel='algorithm', ylabel='accuracy'>
```



In [81]:
```
algorithm_accuracy[['algorithm', 'accuracy', 'hyperparameters']].sort_values(by='accuracy'
```

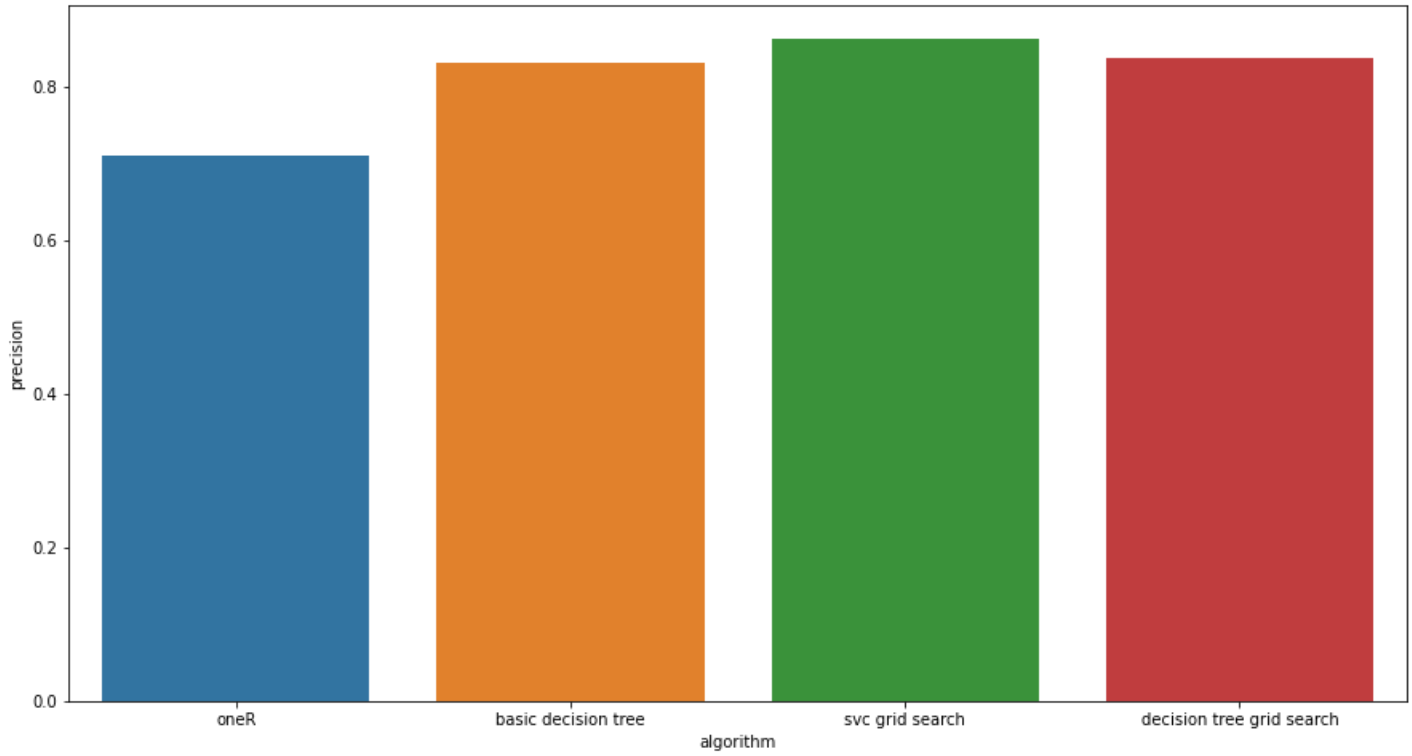
Out[81]:

	algorithm	accuracy	hyperparameters
2	svc grid search	0.866935	C:10,kernel:rbf
3	decision tree grid search	0.829435	criterion:gini,max_depth:11,max_features:4,max...
1	basic decision tree	0.789516	NaN
0	oneR	0.711694	NaN

Môžeme vidieť, že klasifikačný algoritmus SVC s hyperparametrami optimalizovanými cez grid search dosiahol na testovacej sade dát najvyššiu accuracy. Nasledoval rozhodovací strom s hyperparametrami optimalizovanými cez grid search, rozhodovací strom s predvolenými hodnotami hyperparametrov a nakoniec najnižšiu accuracy dosiahol nami implementovaný one-R algoritmus.

In [82]:
```
plt.figure(figsize=(15,8))
sns.barplot(data=algorithm_accuracy, x=algorithm_accuracy.algorithm, y=algorithm_accuracy.
```

Out[82]:
```
<AxesSubplot:xlabel='algorithm', ylabel='precision'>
```



In [83]:
```
algorithm_accuracy[['algorithm', 'precision', 'hyperparameters']].sort_values(by='precisio
```

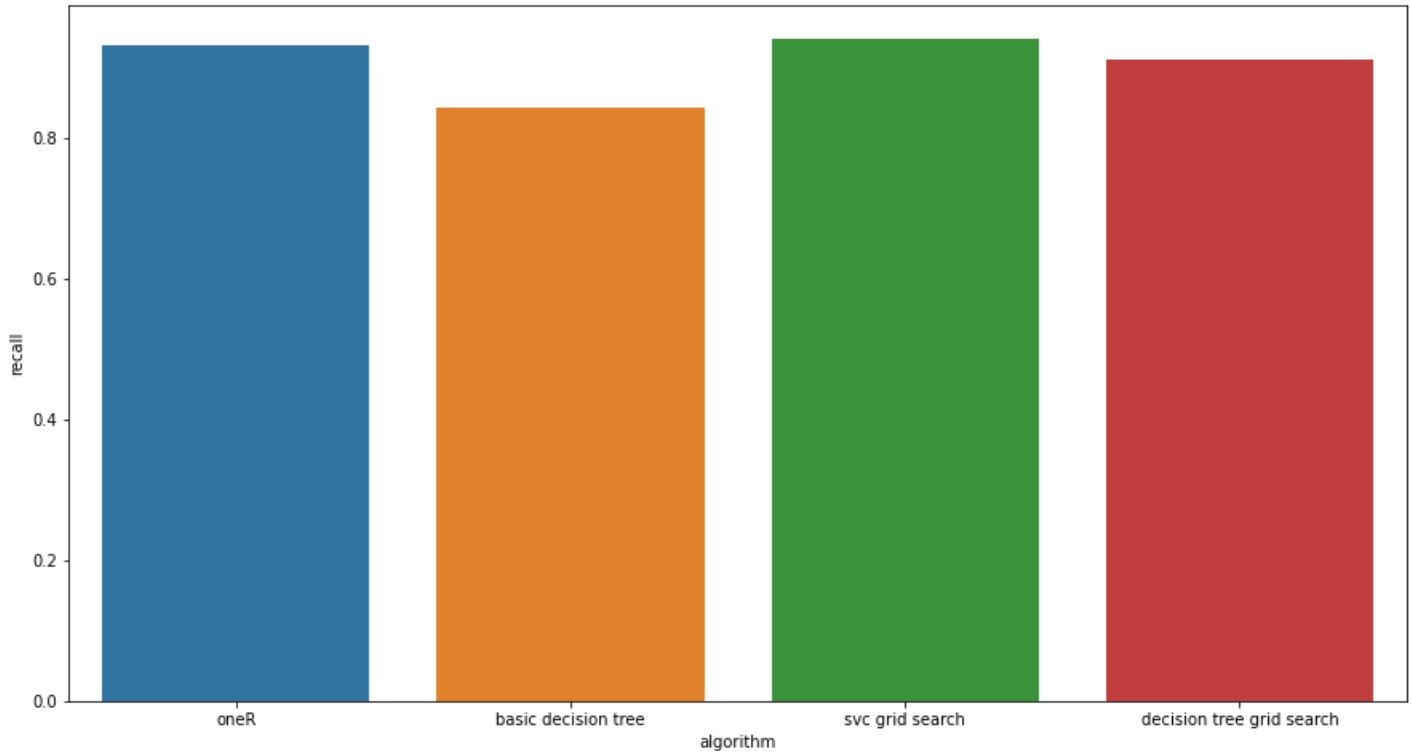
Out[83]:

	algorithm	precision	hyperparameters
2	svc grid search	0.863140	C:10,kernel:rbf
3	decision tree grid search	0.837370	criterion:gini,max_depth:11,max_features:4,max...
1	basic decision tree	0.831169	NaN
0	oneR	0.709647	NaN

Môžeme vidieť, že klasifikačný algoritmus SVC s hyperparametrami optimalizovanými cez grid search dosiahol na testovacej sade dát najvyššiu precision. Nasledoval rozhodovací strom s hyperparametrami optimalizovanými cez grid search, rozhodovací strom s predvolenými hodnotami hyperparametrov a nakoniec najnižšiu precision dosiahol nami implementovaný one-R algoritmus.

In [84]:
```
plt.figure(figsize=(15,8))
sns.barplot(data=algorithm_accuracy, x=algorithm_accuracy.algorithm, y=algorithm_accuracy.
```

Out[84]:
```
<AxesSubplot:xlabel='algorithm', ylabel='recall'>
```



In [85]:
```
algorithm_accuracy[['algorithm', 'recall', 'hyperparameters']].sort_values(by='recall', as
```

Out[85]:

	algorithm	recall	hyperparameters
2	svc grid search	0.942247	C:10,kernel:rbf
0	oneR	0.932831	NaN
3	decision tree grid search	0.911488	criterion:gini,max_depth:11,max_features:4,max...
1	basic decision tree	0.843691	NaN

Môžeme vidieť, že klasifikačný algoritmus SVC s hyperparametrami optimalizovanými cez grid search dosiahol na testovacej sade dát najvyšší recall. Nasledoval nami implementovaný one-R algoritmus, rozhodovací strom s hyperparametrami optimalizovanými cez grid search a najnižší recall dosiahol rozhodovací strom s predvolenými hodnotami hyperparametrov.

4. Vyhodnotenie vplyvu zvolenej stratégie riešenia na klasifikáciu

Najskôr vytvoríme ucelený dataframe z tabuliek profiles a labor a upravíme atribúty tak, ako v druhej fáze, teda odstránime duplikáty, zjednotíme hodnoty, odstránime nepotrebné stĺpce a zakódujeme nečíselné hodnoty.

In [86]:
```
dfp.drop('Unnamed: 0', axis=1, inplace=True)
dfp['race'] = dfp['race'].str.replace('white','White')
dfp['race'] = dfp['race'].str.replace('black','Black')
dfp['race'] = dfp['race'].str.replace('blsck','Black')
dfp['birthdate'] = (pd.to_datetime(dfp.birthdate)).dt.year


dfl.drop('Unnamed: 0', axis=1, inplace=True)
dfl = dfl.drop_duplicates()
dfl['smoker'] = dfl['smoker'].str.replace('N','no')
dfl['smoker'] = dfl['smoker'].str.replace('Y','yes')
```

In [87]:
```
df = pd.merge(dfp, dfl, how="left", on=["ssn"])

df.drop('name_x', axis=1, inplace=True)
df.drop('name_y', axis=1, inplace=True)
df.drop('job', axis=1, inplace=True)
df.drop('address', axis=1, inplace=True)
df.drop('residence', axis=1, inplace=True)
df.drop('relationship', axis=1, inplace=True)
df.drop('blood_group', axis=1, inplace=True)
df.drop('race', axis=1, inplace=True)
df.drop('ssn', axis=1, inplace=True)

# create an object of the OneHotEncoder
ce_OHE = ce.OneHotEncoder(cols=['sex', 'smoker'])

# fit and transform and you will get the encoded data
df = ce_OHE.fit_transform(df)
df = df.rename(columns={"sex_1": "sex_f", "sex_2": "sex_m", "smoker_1": "smoker_no", "smok
df.head()
```

Out[87]:

	birthdate	sex_f	sex_m	leukocyty	smoker_no	smoker_yes	hemoglobin	trombocyty	indicator	alt	wei
0	1925	1	0	6.35996	1	0	7.05602	5.71857	1.0	16.37812	51.36
1	1925	1	0	6.11726	0	1	6.47482	6.54765	1.0	16.43658	29.84
2	1925	1	0	6.65582	1	0	9.75669	8.89793	1.0	15.94319	122.71
3	1925	1	0	6.77521	1	0	6.89806	6.73572	1.0	15.15328	81.49
4	1912	0	1	5.99290	0	1	8.93612	5.38672	1.0	11.70433	65.37

In [88]:
```
from sklearn.model_selection import train_test_split
```

In [89]:
```
nan_columns = df.columns[df.isna().any()].tolist()
nan_columns
```

Out[89]:
```
['leukocyty',
 'hemoglobin',
 'trombocyty',
 'alt',
 'ast',
 'alp',
 'hematokrit',
 'hbver',
 'etytr',
 'er-cv',
 'erytrocyty']
```

In [90]:
```
# imputer
imp_knn = KNNImputer(n_neighbors=5, weights='uniform', metric='nan_euclidean')
def replace_nan(df):
    imp_knn.fit(df[nan_columns])
    df[nan_columns] = imp_knn.transform(df[nan_columns])
    return df
```

In [91]:
```
##funkcia na detekciu outlierov
def identify_outliers(a):
    lower = a.quantile(0.25) - 1.5 * stats.iqr(a)
    upper = a.quantile(0.75) + 1.5 * stats.iqr(a)
```

```
    return a[(a > upper) | (a < lower)]
```

In [92]:
```
##funkcia na detekciu outlierov, vrati oddelene zoznamy indexov prilis vysokych a prilis n
def identify_outliers_low_up(a):
    lower = a.quantile(0.25) - 1.5 * stats.iqr(a)
    upper = a.quantile(0.75) + 1.5 * stats.iqr(a)

    return a[(a < lower)].index.values.astype(int), a[(a > upper)].index.values.astype(int
```

In [93]:
```
##nahradenie hodnot outlierov hodnotami 5. a 95. percentilom rozlozenia
def replace_outliers(df):
    for col in nan_columns + ['birthdate', 'weight']:
        low, up = identify_outliers_low_up(df[col])
        df.loc[low, col] = df[col].quantile(0.05)
        df.loc[up, col] = df[col].quantile(0.95)
    return df
```

In [94]:
```
class Transformer(TransformerMixin):
    def __init__(self, transform_columns, passthrough_columns):
        self.transformer = ColumnTransformer(transformers=[("PT", PowerTransformer(method=
        self.columns = transform_columns + passthrough_columns

    def fit(self, X_pipe, y=None, **fit_params):
        self.transformer.fit(X_pipe)
        return self

    def transform(self, X_pipe, **transform_params):
        X_pipe = pd.DataFrame(self.transformer.transform(X_pipe), columns=self.columns)
        return X_pipe
```

In [95]:
```
class Scaler(TransformerMixin):
    def __init__(self):
        self.scaler = MinMaxScaler()

    def fit(self, X_pipe, y=None, **fit_params):
        self.scaler.fit(X_pipe)
        return self

    def transform(self, X_pipe, **transform_params):
        return pd.DataFrame(self.scaler.transform(X_pipe), columns=X_pipe.columns)
```

In [96]:
```
class FeatureSelector(TransformerMixin):
    def __init__(self):
        self.selector = SelectKBest(mutual_info_regression, k=5)

    def fit(self, X_pipe, y_pipe, **fit_params):
        self.y_ = y_pipe
        return self

    def transform(self, X_pipe, **transform_params):
        self.selector.fit(X_pipe, self.y_)
        scores = pd.Series((0 for col in X_pipe.columns), index=X_pipe.columns, dtype=floa
        mi_values = pd.Series(self.selector.scores_, index=X_pipe.columns)
        for col in mi_values.index:
            scores[col] = mi_values[col]
        scores = scores.sort_values(ascending=False)
        # zmenime poradie stlpcov X_pipe podla scores Series, aby mal rovnake poradie stlp
```

```
        X_pipe = X_pipe[scores.index]
        return X_pipe
```

In [97]:
```
transform_columns = ['leukocyty', 'hemoglobin', 'trombocyty', 'alt', 'ast', 'alp', 'hemato
passthrough_columns = ['birthdate', 'sex_f', 'sex_m', 'smoker_no', 'smoker_yes']
```

In [98]:
```
strategies = pd.DataFrame(columns=['strategy_no', 'accuracy'])
```

Nami zvolené stratégie a ich úspešnosť budeme testovať na klasifikátore Decision Tree s hyperparametrami nájdenými pomocou Grid Search.

Stratégia 1

Ako prvú stratégiu sme zvolili tú, ktorú už máme vypracovanú z predošlej fázy. Na dáta aplikujeme nahradenie chýbajúcich hodnôt pomocou kNN Imputer, outlierov nahradíme hraničnými hodnotami, aplikujeme PowerTransformer na transformáciu dát, MinMaxScaler na scaling dát a SelectkBest feature selector na výber 5 najlepších atribútov.

In [99]:
```
strategies = strategies.append({'strategy_no':1, 'accuracy':algorithm_accuracy[algorithm_a
```

In [100…
```
strategies
```

Out[100…

	strategy_no	accuracy
0	1.0	0.829435

Stratégia 2

V druhej stratégii odstránime z dát chýbajúce hodnoty a rovnako odstránime aj outlierov. Na dáta následne aplikujeme PowerTransformer, MinMaxScaler a nájdeme 5 najlepších atribútov nájdených pomocou SelectKBest algoritmu.

In [101…
```
df2 = deepcopy(df)
len(df2)
```

Out[101…
```
9918
```

In [102…
```
len(df2) - len(df2.dropna())
```

Out[102…
```
324
```

In [103…
```
df2 = df2.dropna()
len(df2)
```

Out[103…
```
9594
```

In [104…
```
outliers = []
d = {}
for col in nan_columns + ['birthdate', 'weight']:
    x = identify_outliers(df2[col]).index.values.astype(int)
    d[col] = x
```

```
    for element in x:
        if element not in outliers:
            outliers.append(element)

print(len(outliers))
df2.drop(outliers, inplace=True)
```

```
703
```

In [105…
```
len(df2)
```

Out[105…
```
8891
```

In [106…
```
ppl = Pipeline([
    ('power-transformer', Transformer(transform_columns, passthrough_columns)),
    ('minmax-scaler', Scaler()),
    ('feature-selector', FeatureSelector())
])
```

In [107…
```
X_train2, X_test2, y_train2, y_test2 = train_test_split(df2.loc[:, df2.columns != 'indicat
```

In [108…
```
ppl_transformed_train2 = ppl.fit_transform(X_train2, y_train2)
ppl_transformed_test2 = ppl.fit_transform(X_test2, y_test2)
```

In [109…
```
selected_columns = ppl_transformed_train2.columns[0:5]
ppl_transformed_train2 = ppl_transformed_train2[selected_columns]
ppl_transformed_test2 = ppl_transformed_test2[selected_columns]
ppl_transformed_train2.head()
```

Out[109…

	hemoglobin	hematokrit	alp	weight	er-cv
0	0.501915	0.579083	0.787202	0.498080	0.478374
1	0.420528	0.386415	0.846173	0.594172	0.381739
2	0.444214	0.394110	0.816524	0.504291	0.586535
3	0.390699	0.455823	0.806909	0.171682	0.154858
4	0.462473	0.833679	0.917501	0.479953	0.536175

In [110…
```
grid_strategy2 = GridSearchCV(decision_tree, param_grid=params, cv=5, verbose=1)
grid_strategy2.fit(ppl_transformed_train2, y_train2)
```

Out[110…
```
Fitting 5 folds for each of 2048 candidates, totalling 10240 fits
GridSearchCV(cv=5, estimator=DecisionTreeClassifier(),
             param_grid={'criterion': ['entropy', 'gini'],
                         'max_depth': [5, 8, 11, 14],
                         'max_features': [2, 3, 4, 5],
                         'max_leaf_nodes': [50, 100, 200, 300],
                         'min_samples_leaf': [5, 8, 11, 14],
                         'min_samples_split': [5, 8, 11, 14]},
             verbose=1)
```

In [111…
```
ypred_strategy2 = grid_strategy2.best_estimator_.predict(ppl_transformed_test2)
```

In [112…

```
acc = metrics.accuracy_score(y_test2, ypred_strategy2)
print("Accuracy of strategy 2:", acc * 100, '%')
```

```
Accuracy of strategy 2: 74.3139901034638 %
```

In [113…
```
strategies = strategies.append({'strategy_no':2, 'accuracy':acc}, ignore_index=True)
```

In [114…
```
strategies
```

Out[114…

	strategy_no	accuracy
0	1.0	0.829435
1	2.0	0.743140

Stratégia 3

V tretej stratégii nahradíme chýbajúce hodnoty pomocou kNN Imputera, nahradíme outlierov hraničnými hodnotami, následne aplikujeme PowerTransformer a použijeme 5 najlepších atribútov nájdených pomocou SelectkBestfeature selectora vo fáze 2. V tejto stratégii teda vynecháme scaleovanie dát.

In [115…
```
df3 = deepcopy(df)
```

Chýbajúce hodnoty nahradíme pomocou kNN imputera definovaného vyššie.

In [116…
```
df3 = replace_nan(df3)
```

Nahradíme outlierov v stĺpcoch hraničnými hodnotami stĺpca pomocou vyššie definovaných funkcií. Konkrétne outlierov za maximom nahradíme hodnotou 95. percentilu a outlierov za minimom nahradíme hodnotou 5. percentilu.

In [117…
```
df3 = replace_outliers(df3)
```

In [118…
```
ppl = Pipeline([
    ('power-transformer', Transformer(transform_columns, passthrough_columns)),
#     ('minmax-scaler', Scaler()),
    ('feature-selector', FeatureSelector())
])
```

In [119…
```
X_train3, X_test3, y_train3, y_test3 = train_test_split(df3.loc[:, df3.columns != 'indicat
```

In [120…
```
ppl_transformed_train3 = ppl.fit_transform(X_train3, y_train3)
ppl_transformed_test3 = ppl.fit_transform(X_test3, y_test3)
```

In [121…
```
selected_columns = ppl_transformed_train3.columns[0:5]
ppl_transformed_train3 = ppl_transformed_train3[selected_columns]
ppl_transformed_test3 = ppl_transformed_test3[selected_columns]
ppl_transformed_train3.head()
```

Out[121…

	hematokrit	hemoglobin	er-cv	erytrocyty	trombocyty

	hematokrit	hemoglobin	er-cv	erytrocyty	trombocyty
0	0.012197	-0.226416	1.417755	-0.792104	-0.640707
1	0.571076	-1.007615	0.027734	0.117999	0.251817
2	-1.131187	-0.437555	-1.462301	-0.342285	-0.313655
3	0.757635	0.433252	-0.483808	-0.845957	0.110272
4	1.976842	0.403038	-0.490270	1.016514	0.537510

In [122…
```
grid_strategy3 = GridSearchCV(decision_tree, param_grid=params, cv=5, verbose=1)
grid_strategy3.fit(ppl_transformed_train3, y_train3)
```

Out[122…
```
Fitting 5 folds for each of 2048 candidates, totalling 10240 fits
GridSearchCV(cv=5, estimator=DecisionTreeClassifier(),
             param_grid={'criterion': ['entropy', 'gini'],
                         'max_depth': [5, 8, 11, 14],
                         'max_features': [2, 3, 4, 5],
                         'max_leaf_nodes': [50, 100, 200, 300],
                         'min_samples_leaf': [5, 8, 11, 14],
                         'min_samples_split': [5, 8, 11, 14]},
             verbose=1)
```

In [123…
```
ypred_strategy3 = grid_strategy3.best_estimator_.predict(ppl_transformed_test3)
```

In [124…
```
acc = metrics.accuracy_score(y_test3, ypred_strategy3)
print("Accuracy of strategy 3:", acc * 100, '%')
```

```
Accuracy of strategy 3: 74.87903225806451 %
```

In [125…
```
strategies = strategies.append({'strategy_no':3, 'accuracy':acc}, ignore_index=True)
```

Stratégia 4

V štvrtej stratégii nahradíme chýbajúce hodnoty pomocou kNN Imputera, nahradíme outlierov hraničnými hodnotami, následne aplikujeme MinMaxScaler a použijeme 5 najlepších atribútov nájdených pomocou SelectkBestfeature selectora. V tejto stratégii teda vynecháme tranformáciu dát.

In [126…
```
df4 = deepcopy(df)
```

In [127…
```
df4 = replace_nan(df4)
```

In [128…
```
df4 = replace_outliers(df4)
```

In [129…
```
ppl = Pipeline([
#     ('power-transformer', Transformer(transform_columns, passthrough_columns)),
    ('minmax-scaler', Scaler()),
    ('feature-selector', FeatureSelector())
])
```

In [130…
```
X_train4, X_test4, y_train4, y_test4 = train_test_split(df4.loc[:, df4.columns != 'indicat
```

In [131…
```
ppl_transformed_train4 = ppl.fit_transform(X_train4, y_train4)
ppl_transformed_test4 = ppl.fit_transform(X_test4, y_test4)
```

In [132…
```
selected_columns = ppl_transformed_train4.columns[0:5]
ppl_transformed_train4 = ppl_transformed_train4[selected_columns]
ppl_transformed_test4 = ppl_transformed_test4[selected_columns]
ppl_transformed_train4.head()
```

Out[132…

	hematokrit	hemoglobin	alp	ast	sex_m
0	0.676294	0.537658	0.727326	0.399832	0.0
1	0.603914	0.249173	0.450137	0.294225	0.0
2	0.439748	0.560677	0.679233	0.436055	0.0
3	0.605405	0.372947	0.773072	0.520539	0.0
4	0.252796	0.248474	0.465794	0.339884	0.0

In [133…
```
grid_strategy4 = GridSearchCV(decision_tree, param_grid=params, cv=5, verbose=1)
grid_strategy4.fit(ppl_transformed_train4, y_train4)
```

Out[133…
```
Fitting 5 folds for each of 2048 candidates, totalling 10240 fits
GridSearchCV(cv=5, estimator=DecisionTreeClassifier(),
             param_grid={'criterion': ['entropy', 'gini'],
                         'max_depth': [5, 8, 11, 14],
                         'max_features': [2, 3, 4, 5],
                         'max_leaf_nodes': [50, 100, 200, 300],
                         'min_samples_leaf': [5, 8, 11, 14],
                         'min_samples_split': [5, 8, 11, 14]},
             verbose=1)
```

In [134…
```
ypred_strategy4 = grid_strategy4.best_estimator_.predict(ppl_transformed_test4)
```

In [135…
```
acc = metrics.accuracy_score(y_test4, ypred_strategy4)
print("Accuracy of strategy 4:", acc * 100, '%')
```

```
Accuracy of strategy 4: 74.83870967741936 %
```

In [136…
```
strategies = strategies.append({'strategy_no':4, 'accuracy':acc}, ignore_index=True)
```

Porovnanie stratégií

In [137…
```
strategies
```

Out[137…

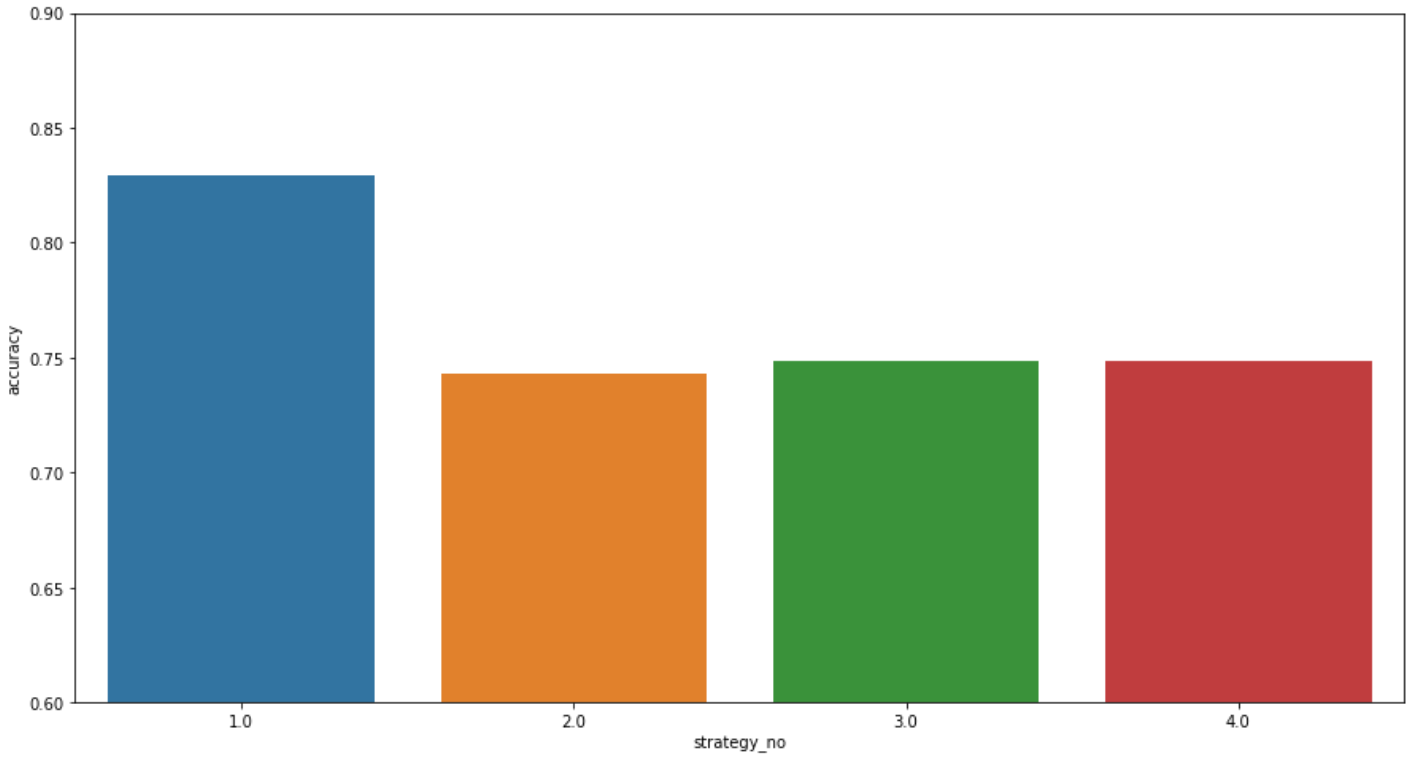
	strategy_no	accuracy
0	1.0	0.829435
1	2.0	0.743140
2	3.0	0.748790
3	4.0	0.748387

In [138…

```
plt.figure(figsize=(15,8))
plt.ylim(0.6, 0.9)
sns.barplot(data=strategies, x=strategies.strategy_no, y=strategies.accuracy)
```

Out[138…

```
<AxesSubplot:xlabel='strategy_no', ylabel='accuracy'>
```



In [139…

```
strategies[['strategy_no', 'accuracy']].sort_values(by='accuracy', ascending=False).head(1
```

Out[139…

	strategy_no	accuracy
0	1.0	0.829435

Po porovnaní stratégií sme zistili, že prvá stratégia dosahuje najvyššiu úspešnosť. Teda najlepším prístupom je nahradenie NaN values pomocou kNN imputera, nahradenie outlierov hraničnými hodnotami stĺpcov, aplikovanie scaleovania dát cez MinMaxScaler, aplikovanie transformácie dát cez PowerTransformer a výber atribútov pomocou SelectKBest algoritmu.

Najmenej úspešná bola stratégia číslo 2, teda stratégia v ktorej sme v predspracovaní dát odstránili NaN values, odstránili outlierov a následne na takto očistené dáta aplikovali MinMaxScaler scaling a PowerTransformer transformáciu.

Porovnanie rôznych algoritmov klasifikácie máme v predošlej sekcii tohto dokumentu - porovnávali sme náš One-R klasifikátor, SVC s hyperparametrami podľa Grid Search, Decision Tree s predvolenými hodnotami hyperparametrov a Decision Tree s použitím hyperparametrov nájdených pomocou Grid Search. Najúspešnejší je SVC s hyperparametrami a za ním Decision Tree s hyperparametrami.

In [ ]: