HW4_Question5_CART

April 10, 2021

[20]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

# features
Outlook = [0,0,1,1,2,2] # Outlook Catelogies-- Sunny:0, Overcast:1, Rainy:2
Temperature = [1,1,1,0,0,0] # Temp Catelogies-- High:1, Low:0
Humidity = [1,1,0,0,1,1] # Humidity Catelogies-- High:1, Low:0
Windy = [0,1,0,1,0,1] # Windy Catelogies-- Yes:1, No:0
# target
Decision = [0,0,1,1,1,0] # Decision Catelogies-- Play:1, No Play:0
# Build Dataset
data = {"Outlook":Outlook,"Temperature":Temperature,"Humidity":Humidity,"Windy":
 ↪Windy,"Decision":Decision}
df = pd.DataFrame(data, index=[1,2,3,4,5,6])
df
```

[20]:

	Outlook	Temperature	Humidity	Windy	Decision
1	0	1	1	0	0
2	0	1	1	1	0
3	1	1	0	0	1
4	1	0	0	1	1
5	2	0	1	0	1
6	2	0	1	1	0

[23]:
```
from sklearn import tree
# split the dataset into features and targets
features = df.iloc[:,0:4].to_numpy()
targets = df.iloc[:,4].to_numpy()

# do CART, a type of decision tree classification
cart = tree.DecisionTreeClassifier(criterion="gini")
cart.fit(features, targets)

fig, axes = plt.subplots(nrows = 1,ncols = 1,figsize = (3,3), dpi=200)
# plot a decision tree, class_name follows ascending
tree.plot_tree(cart, feature_names=["outlook","temp","humd","windy"],
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 ↪class_names=["noplay","play"],filled=True,rounded=True,fontsize=5)
fig.savefig('image.png')
```