

Forward School

Program Code: J620-002-4:2020

Program Name: FRONT-END SOFTWARE DEVELOPMENT

Title : Exe20 - Decision Tree Exercise 2

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Introduction : Decision Tree algorithm partitions the data into subsets by repeatedly asking questions about the features of the data points.

Conclusion : Still need to practice more and do revision

Decision Tree

In [5]:

```

from sklearn.datasets import load_iris
from sklearn.tree import DecisionTreeClassifier
import pandas as pd
iris = load_iris()
X = iris.data[:, 3:] # petal length and width
y = iris.target

df = pd.DataFrame(data = iris.data, columns = iris.feature_names)

df

```

Out[5]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2
...
145	6.7	3.0	5.2	2.3
146	6.3	2.5	5.0	1.9
147	6.5	3.0	5.2	2.0
148	6.2	3.4	5.4	2.3
149	5.9	3.0	5.1	1.8

150 rows × 4 columns

DecisionTree Modeling ¶

In [6]:

```

from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=1)
# clf = DecisionTreeClassifier(max_depth=3)
# clf.fit(X_train, y_train)
# y_pred = clf.predict(X_test)

# accuracy = accuracy_score(y_test, y_pred)
# print("Accuracy:", accuracy)

```

Build decision tree in both entropy and GINI

In [7]:

```
clfentropy = DecisionTreeClassifier(criterion='entropy')
entropy = clfentropy.fit(X_train, y_train)
y_pred_entropy = entropy.predict(X_test)
y_pred_entropy
```

Out[7]:

```
array([0, 1, 1, 0, 2, 1, 2, 0, 0, 2, 1, 0, 2, 1, 1, 0, 1, 1, 0, 0, 1, 1,
       2, 0, 2, 1, 0, 0, 1, 2, 1, 2, 1, 2, 2, 0, 1, 0, 1, 2, 2, 0, 1, 2,
       1])
```

Convert to Decision Tree Diagram

In [8]:

```
clfGini = DecisionTreeClassifier(criterion='gini')
gini = clfGini.fit(X_train, y_train)
y_pred_gini = gini.predict(X_test)
y_pred_gini
```

Out[8]:

```
array([0, 1, 1, 0, 2, 1, 2, 0, 0, 2, 1, 0, 2, 1, 1, 0, 1, 1, 0, 0, 1, 1,
       2, 0, 2, 1, 0, 0, 1, 2, 1, 2, 1, 2, 2, 0, 1, 0, 1, 2, 2, 0, 1, 2,
       1])
```

In [10]:

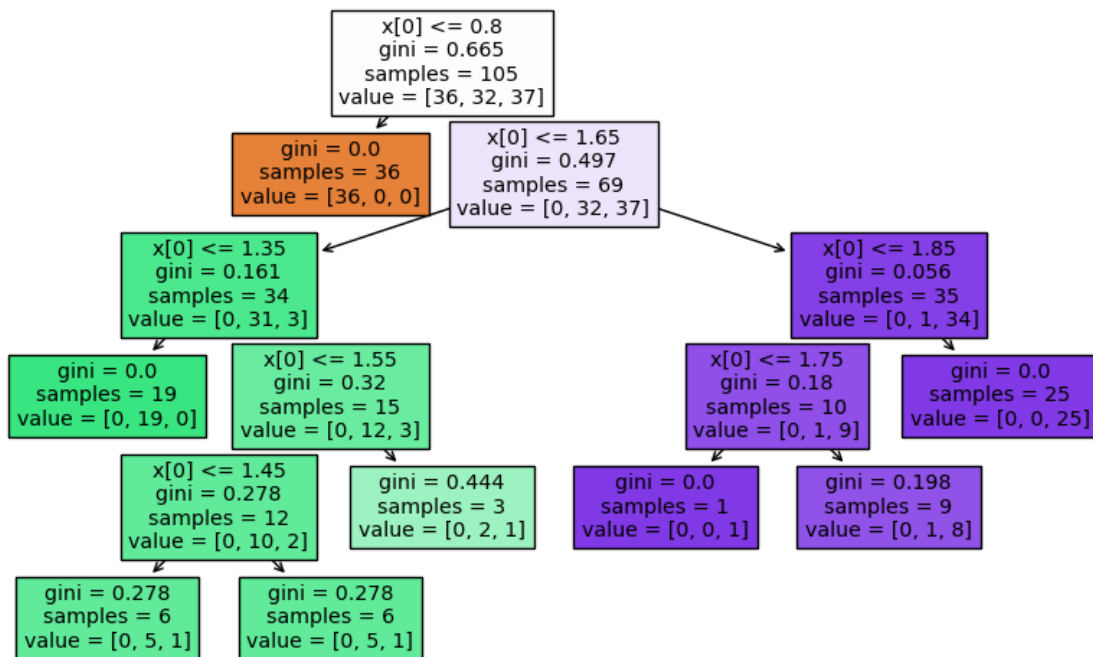
```

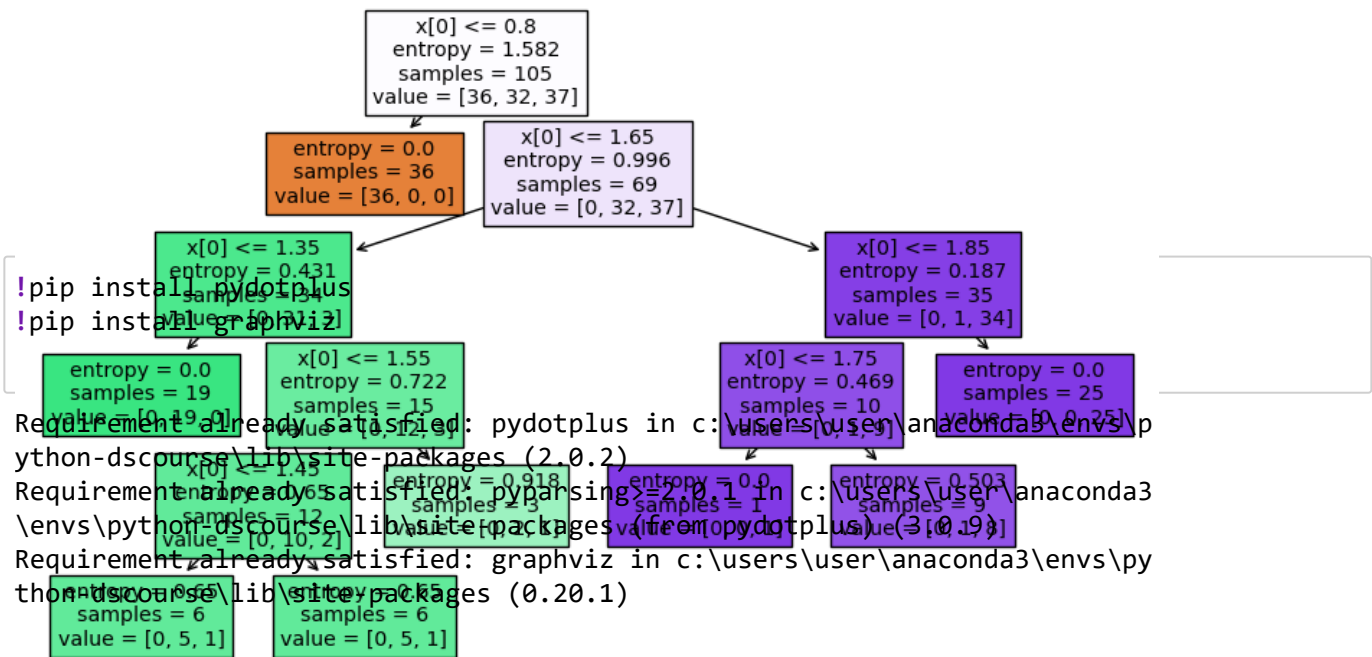
# from sklearn.tree import export_graphviz
# from six import StringIO
# from IPython.display import Image
# import pydotplus

# dot_data = StringIO()
# export_graphviz(gini, out_file=dot_data,
#                 filled=True, rounded=True,
#                 special_characters=True
#                 )
# graph = pydotplus.graph_from_dot_data(dot_data.getvalue())
# graph.write_png('tree.png')
# Image(graph.create_png())
import matplotlib.pyplot as plt
from sklearn import metrics, tree
plt.figure(figsize=(10, 6))
tree.plot_tree(gini, filled=True)
plt.show()

plt.figure(figsize=(10, 6))
tree.plot_tree(entropy, filled=True)
plt.show()

```





In [23]:

```
!pip install scikit-learn
!pip install six
!pip install ipython
!pip install pydotplus
```

```
Requirement already satisfied: scikit-learn in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (1.3.0)
Requirement already satisfied: numpy>=1.17.3 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from scikit-learn) (1.24.3)
Requirement already satisfied: scipy>=1.5.0 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from scikit-learn) (1.10.1)
Requirement already satisfied: joblib>=1.1.1 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from scikit-learn) (1.2.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from scikit-learn) (3.2.0)
Requirement already satisfied: six in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (1.16.0)
Requirement already satisfied: ipython in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (8.12.0)
Requirement already satisfied: backcall in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (0.2.0)
Requirement already satisfied: decorator in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (5.1.1)
Requirement already satisfied: jedi>=0.16 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (0.18.1)
Requirement already satisfied: matplotlib-inline in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (0.1.6)
Requirement already satisfied: pickleshare in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (0.7.5)
Requirement already satisfied: prompt-toolkit!=3.0.37,<3.1.0,>=3.0.30 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (3.0.36)
Requirement already satisfied: pygments>=2.4.0 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (2.15.1)
Requirement already satisfied: stack-data in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (0.2.0)
Requirement already satisfied: traitlets>=5 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (5.7.1)
Requirement already satisfied: colorama in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from ipython) (0.4.6)
Requirement already satisfied: parso<0.9.0,>=0.8.0 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from jedi>=0.16->ipython) (0.8.3)
Requirement already satisfied: wcwidth in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from prompt-toolkit!=3.0.37,<3.1.0,>=3.0.30->ipython) (0.2.5)
Requirement already satisfied: executing in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from stack-data->ipython) (0.8.3)
Requirement already satisfied: asttokens in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from stack-data->ipython) (2.0.5)
Requirement already satisfied: pure-eval in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from stack-data->ipython) (0.2.2)
Requirement already satisfied: six in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from asttokens->stack-data->ipython) (1.16.0)
Requirement already satisfied: pydotplus in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (2.0.2)
Requirement already satisfied: pyparsing>=2.0.1 in c:\users\user\anaconda3\envs\python-dscourse\lib\site-packages (from pydotplus) (3.0.9)
```

In []: