

MACHINE LEARNING – 2CS501

PRACTICAL 6

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1) Decision Tree - Layeggs

Code:

```
import matplotlib.pyplot as plt
import pandas as pd
from sklearn.preprocessing import LabelEncoder
from sklearn.tree import DecisionTreeClassifier
from sklearn import metrics, tree
from sklearn.metrics import classification_report, confusion_matrix

w = pd.read_csv("layeggs.csv")
#print(w)
#print(w.describe())

X = w[['Animal', 'Warmblooded', 'Feathers', 'Fur', 'Swims']]
y = w[['Class']]

le = LabelEncoder()
pnew = pd.DataFrame()
data_top = X.head()
print(data_top)
for val in data_top:
    #print('val : ', val)
    pnew[val] = le.fit_transform(w[val])
pnew = pnew.drop(columns=['Animal'])
print('pnew : \n', pnew)

clf = DecisionTreeClassifier(criterion="entropy", max_depth=3)

clf = clf.fit(pnew, y)

y_pred = clf.predict(pnew)
print(y_pred)

print("Accuracy : ", metrics.accuracy_score(y, y_pred))
print(confusion_matrix(y, y_pred))
print(classification_report(y, y_pred))

fn = ['Warmblooded', 'Feathers', 'Fur', 'Swims']
cn = ['No', 'Yes']
fig, axes = plt.subplots(nrows=1, ncols=1, figsize=(4, 4), dpi=300)
tree.plot_tree(clf, feature_names=fn, class_names=cn, filled=True)
fig.savefig('Layeggs.png')
```

```
# Tree Drawing, Entropy vs Ginni Indexing, why not use Animal for classification?
```

```
"""
```

```
    Animal Warmblooded Feathers Fur Swims
0    Ostrich         Yes      Yes  No   No
1  Crocodile         No       No   No   Yes
2     Raven         Yes      Yes  No   No
3  Albatross         Yes      Yes  No   No
4   Dolphin         Yes       No   No   Yes
```

```
pnwnew :
```

```
    Warmblooded  Feathers  Fur  Swims
0              1         1    0     0
1              0         0    0     1
2              1         1    0     0
3              1         1    0     0
4              1         0    0     1
5              1         0    1     0
```

```
['Yes' 'Yes' 'Yes' 'Yes' 'No' 'No']
```

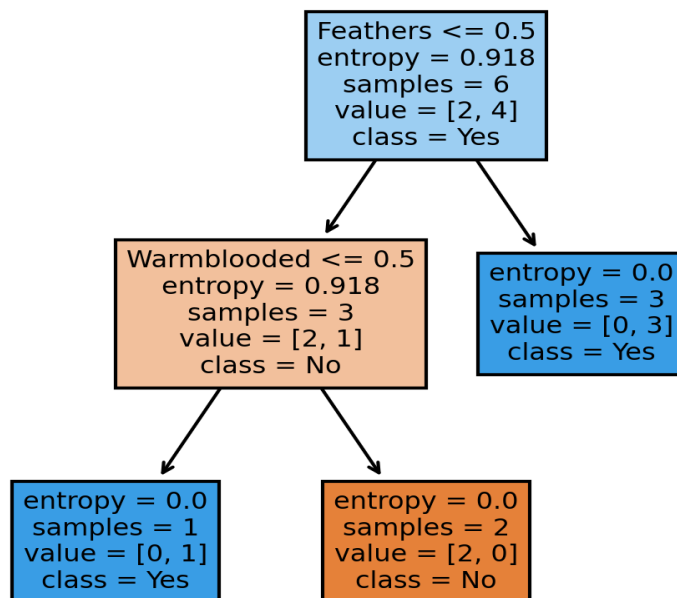
```
Accuracy : 1.0
```

```
[[2 0]
```

```
 [0 4]]
```

| | precision | recall | f1-score | support |
|--------------|-----------|--------|----------|---------|
| No | 1.00 | 1.00 | 1.00 | 2 |
| Yes | 1.00 | 1.00 | 1.00 | 4 |
| accuracy | | | 1.00 | 6 |
| macro avg | 1.00 | 1.00 | 1.00 | 6 |
| weighted avg | 1.00 | 1.00 | 1.00 | 6 |

```
"""
```



2) Decision Tree - Iris

Code:

[illegible]

