

7_LeafSpeciesDetection_DECISION x

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Day-5 | Leaf Species Detection | DECISION TREE

Import basic Libraries

from sklearn.datasets import load_iris
import pandas as pd
import numpy as np

Load Dataset

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Load Dataset

0s [2] dataset = load_iris()

Summarize Dataset

print(dataset.data)
print(dataset.target)

print(dataset.data.shape)

[[5.1 3.5 1.4 0.2]

0s completed at 19:33



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[6.3 2.9 5.6 1.8]

▼ Segregate Dataset into X (Input/IndependentVariable) & Y (Output/DependentVariable)

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0s X = pd.DataFrame(dataset.data, columns=dataset.feature_names)
X

	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

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Splitting Dataset into Train & Test

0s


```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, Y, test_size = 0.25, random_state = 0)
print(X_train.shape)
print(X_test.shape)
```

(112, 4)

(38, 4)

Finding best max_depth Value

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0s (112, 4)
(38, 4)

▼ Finding best max_depth Value

```
accuracy = []  
from sklearn.tree import DecisionTreeClassifier  
from sklearn.metrics import accuracy_score  
import matplotlib.pyplot as plt  
  
for i in range(1, 10):  
    model = DecisionTreeClassifier(max_depth = i, random_state = 0)  
    model.fit(X_train, y_train)
```

Executing (0s)



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```
model.fit(X_train, y_train)
pred = model.predict(X_test)
score = accuracy_score(y_test, pred)
accuracy.append(score)

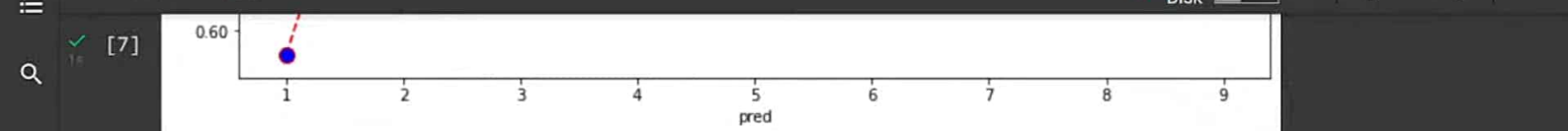
plt.figure(figsize=(12, 6))
plt.plot(range(1, 10), accuracy, color='red', linestyle='dashed', marker='o',
         markerfacecolor='blue', markersize=10)
plt.title('Finding best Max_Depth')
plt.xlabel('pred')
plt.ylabel('score')

Text(0, 0.5, 'score')
```

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Training

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```
from sklearn.tree import DecisionTreeClassifier
model = DecisionTreeClassifier(criterion = 'entropy', max_depth = 3, random_state = 0)
model.fit(X_train, y_train)
```

DecisionTreeClassifier(ccp_alpha=0.0, class_weight=None, criterion='entropy', max_depth=3, max_features=None, max_leaf_nodes=None, min_impurity_decrease=0.0, min_impurity_split=None, min_samples_leaf=1, min_samples_split=2, min_weight_fraction_leaf=0.0, presort='deprecated', random_state=0, splitter='best')

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Prediction

0s

```
y_pred = model.predict(X_test)
print(np.concatenate((y_pred.reshape(len(y_pred),1), y_test.reshape(len(y_test),1)),1))
```

```
[[2 2]
 [1 1]
 [0 0]
 [2 2]
 [0 0]
 [2 2]
 [0 0]
 [1 1]
 [1 1]
 [1 1]
 [2 2]
 [1 1]
 [1 1]
 [1 1]]
```

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Accuracy Score

```
[ ] from sklearn.metrics import accuracy_score
print("Accuracy of the Model: {0}%".format(accuracy_score(y_test, y_pred)*100))
```

Accuracy of the Model: 97.36842105263158%

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