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Link Colab :

<https://colab.research.google.com/drive/14KoQ1HNWPzRP47Zuuf1msqS8CuzNqLs1?usp=sharing>

Link Github :

https://github.com/Dinaeks19/DATA_MINING/tree/ece1551e7cabcbc821e71d37dc453bc4af7acb3f/LATIHAN%207

The image displays two screenshots of a Google Colab notebook titled "DecisionTree.ipynb".

The top screenshot shows the first cell of code being executed. The code imports `DecisionTreeClassifier` from `sklearn.tree`, imports `datasets` from `sklearn`, and imports `matplotlib.pyplot` as `plt`. It then loads the Iris dataset using `iris = datasets.load_iris()`, extracts the features and target, and prints the features. The output shows the first 15 rows of the Iris dataset features.

```
[1] from sklearn.tree import DecisionTreeClassifier
from sklearn import datasets
import matplotlib.pyplot as plt

iris = datasets.load_iris()
features = iris['data']
target = iris['target']
print(features)
len(features)
```

The bottom screenshot shows the same notebook after the second cell is executed. The code in the second cell prints the entire Iris dataset features, which are displayed as a list of 150 rows, each containing 4 numerical values representing the features of an Iris flower.

```
[0] [5.1 2.5 3. 1.1]
[1] [5.7 2.8 4.1 1.3]
[2] [6.3 3.3 6. 2.5]
[3] [5.8 2.7 5.1 1.9]
[4] [7.1 3. 5.9 2.1]
[5] [6.3 2.9 5.6 1.8]
[6] [6.5 3. 5.8 2.2]
[7] [7.6 3. 6.6 2.1]
[8] [4.9 2.5 4.5 1.7]
[9] [7.3 2.9 6.3 1.8]
[10] [6.7 2.5 5.8 1.8]
[11] [7.2 3.6 6.1 2.5]
[12] [6.5 3.2 5.1 2. ]
[13] [6.4 2.7 5.3 1.9]
[14] [6.8 3. 5.5 2.1]
[15] [5.7 2.5 5. 2. ]
[16] [5.8 2.8 5.1 2.4]
[17] [6.1 3. 4.9 1.8]
[18] [6.4 2.8 5.6 2.1]
[19] [7.2 3. 5.8 1.6]
[20] [7.4 2.8 6.1 1.9]
[21] [7.9 3.8 6.4 2. ]
[22] [6.4 2.8 5.6 2.2]
[23] [6.3 2.8 5.1 1.5]
[24] [6.1 2.6 5.6 1.4]
[25] [7.7 3. 6.1 2.3]
[26] [6.3 3.4 5.6 2.4]
[27] [6.4 3.1 5.5 1.8]
[28] [6.5 2.9 5.6 1.8]
[29] [6.5 3. 5.8 2.2]
[30] [7.6 3. 6.6 2.1]
[31] [4.9 2.5 4.5 1.7]
[32] [7.3 2.9 6.3 1.8]
[33] [6.7 2.5 5.8 1.8]
[34] [7.2 3.6 6.1 2.5]
[35] [6.5 3.2 5.1 2. ]
[36] [6.4 2.7 5.3 1.9]
[37] [6.8 3. 5.5 2.1]
[38] [5.7 2.5 5. 2. ]
[39] [5.8 2.8 5.1 2.4]
[40] [6.1 3. 4.9 1.8]
[41] [6.4 2.8 5.6 2.1]
[42] [7.2 3. 5.8 1.6]
[43] [7.4 2.8 6.1 1.9]
[44] [7.9 3.8 6.4 2. ]
[45] [6.4 2.8 5.6 2.2]
[46] [6.3 2.8 5.1 1.5]
[47] [6.1 2.6 5.6 1.4]
[48] [7.7 3. 6.1 2.3]
[49] [6.3 3.4 5.6 2.4]
[50] [6.4 3.1 5.5 1.8]
[51] [6.5 2.9 5.6 1.8]
[52] [6.5 3. 5.8 2.2]
[53] [7.6 3. 6.6 2.1]
[54] [4.9 2.5 4.5 1.7]
[55] [7.3 2.9 6.3 1.8]
[56] [6.7 2.5 5.8 1.8]
[57] [7.2 3.6 6.1 2.5]
[58] [6.5 3.2 5.1 2. ]
[59] [6.4 2.7 5.3 1.9]
[60] [6.8 3. 5.5 2.1]
[61] [5.7 2.5 5. 2. ]
[62] [5.8 2.8 5.1 2.4]
[63] [6.1 3. 4.9 1.8]
[64] [6.4 2.8 5.6 2.1]
[65] [7.2 3. 5.8 1.6]
[66] [7.4 2.8 6.1 1.9]
[67] [7.9 3.8 6.4 2. ]
[68] [6.4 2.8 5.6 2.2]
[69] [6.3 2.8 5.1 1.5]
[70] [6.1 2.6 5.6 1.4]
[71] [7.7 3. 6.1 2.3]
[72] [6.3 3.4 5.6 2.4]
[73] [6.4 3.1 5.5 1.8]
[74] [6.5 2.9 5.6 1.8]
[75] [6.5 3. 5.8 2.2]
[76] [7.6 3. 6.6 2.1]
[77] [4.9 2.5 4.5 1.7]
[78] [7.3 2.9 6.3 1.8]
[79] [6.7 2.5 5.8 1.8]
[80] [7.2 3.6 6.1 2.5]
[81] [6.5 3.2 5.1 2. ]
[82] [6.4 2.7 5.3 1.9]
[83] [6.8 3. 5.5 2.1]
[84] [5.7 2.5 5. 2. ]
[85] [5.8 2.8 5.1 2.4]
[86] [6.1 3. 4.9 1.8]
[87] [6.4 2.8 5.6 2.1]
[88] [7.2 3. 5.8 1.6]
[89] [7.4 2.8 6.1 1.9]
[90] [7.9 3.8 6.4 2. ]
[91] [6.4 2.8 5.6 2.2]
[92] [6.3 2.8 5.1 1.5]
[93] [6.1 2.6 5.6 1.4]
[94] [7.7 3. 6.1 2.3]
[95] [6.3 3.4 5.6 2.4]
[96] [6.4 3.1 5.5 1.8]
[97] [6.5 2.9 5.6 1.8]
[98] [6.5 3. 5.8 2.2]
[99] [7.6 3. 6.6 2.1]
```

```
DecisionTree.ipynb - Collabora...
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Section
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[2] [6.4 2.8 5.6 2.2]
[6.3 2.8 5.1 1.5]
[6.1 2.6 5.6 1.4]
[7.7 3. 6.1 2.3]
[6.3 3.4 5.6 2.4]
[6.4 3.1 5.5 1.8]
[6. 3. 4.8 1.8]
[6.9 3.1 5.4 2.1]
[6.7 3.1 5.6 2.4]
[6.9 3.1 5.1 2.3]
[5.8 2.7 5.1 1.9]
[6.8 3.2 5.9 2.3]
[6.7 3.3 5.7 2.5]
[6.7 3. 5.2 2.3]
[6.3 2.5 5. 1.9]
[6.5 3. 5.2 2. ]
[6.2 3.4 5.4 2.3]
[5.9 3. 5.1 1.8]]
150

decisiontree = DecisionTreeClassifier(random_state=0, max_depth=None,
min_samples_split=2, min_samples_leaf=1,
min_weight_fraction_leaf=0,
max_leaf_nodes=None,
min_impurity_decrease=0)

[4] model = decisiontree.fit(features, target)

[5] observation = [[5, 4, 3, 2]]
model.predict(observation)
model.predict_proba(observation)
```

```
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Table of contents
Section
{x}

[5] observation = [[5, 4, 3, 2]]
model.predict(observation)
model.predict_proba(observation)

array([[0., 1., 0.]])

[6] from sklearn.utils.multiclass import class_distribution
import pydotplus
from sklearn import tree
dot_data = tree.export_graphviz(decisiontree, out_file=None,
feature_names=iris['feature_names'],
class_names=iris['target_names'])

from IPython.display import Image
graph = pydotplus.graph_from_dot_data(dot_data)
Image(graph.create_png())
graph.write_png('iris.png')

True
```