

ML lab assignment 4 :

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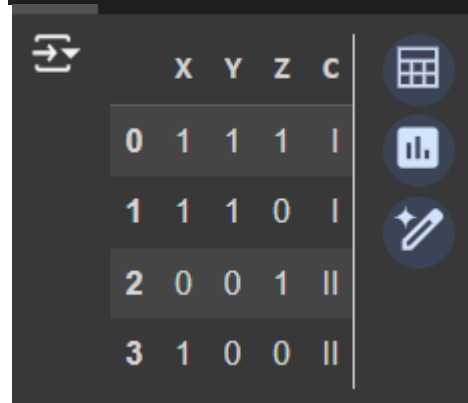
Reg.no : 22BCE7342

Slot: L20 + L21

importing data

```
import pandas as pd

df =
pd.read_csv('https://raw.githubusercontent.com/Anuragsiliveri/MLlabscvs/main/data4.csv')
df
```



	X	Y	Z	C
0	1	1	1	I
1	1	1	0	I
2	0	0	1	II
3	1	0	0	II

importing x values

```
import pandas as pd

df =
pd.read_csv('https://raw.githubusercontent.com/Anuragsiliveri/MLlabscvs/main/data4.csv')
d = df.values
x = d[:, :-1]
x
```

```
⇒ array([[1, 1, 1],
         [1, 1, 0],
         [0, 0, 1],
         [1, 0, 0]], dtype=object)
```

importing y values

```
import pandas as pd

df =
pd.read_csv('https://raw.githubusercontent.com/Anuragsiliveri/MLlabscvs
/main/data4.csv')
d = df.values
y = d[:, -1]
y
```

```
⇒ array(['I', 'I', 'II', 'II'], dtype=object)
```

Splitting the data to train and test

```
from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(x, y,
test_size=0.3, random_state=42)
```

Train the Decision Tree Model

```
from sklearn.tree import DecisionTreeClassifier, export_text

dt_classifier = DecisionTreeClassifier(criterion='entropy',
random_state=42)

dt_classifier.fit(X_train, y_train)
```

```
⇒ ▾ DecisionTreeClassifier
   DecisionTreeClassifier(criterion='entropy', random_state=42)
```

Evaluate the Model

```
from sklearn.tree import DecisionTreeClassifier, export_text
from sklearn.metrics import accuracy_score, classification_report

y_pred = dt_classifier.predict(X_test)

accuracy = accuracy_score(y_test, y_pred)
print(f"Accuracy: {accuracy * 100:.2f}%")

print(classification_report(y_test, y_pred))
```

```
➡ Accuracy: 100.00%
```

	precision	recall	f1-score	support
I	1.00	1.00	1.00	1
II	1.00	1.00	1.00	1
accuracy			1.00	2
macro avg	1.00	1.00	1.00	2
weighted avg	1.00	1.00	1.00	2

Visualize the Decision Tree

```
from sklearn.metrics import accuracy_score, classification_report

feature_names = ['feature1', 'feature2', 'feature3']

tree_rules = export_text(dt_classifier, feature_names=feature_names)
print(tree_rules)
```

```
➡ |--- feature2 <= 0.50
   |   |--- class: II
   |--- feature2 > 0.50
   |   |--- class: I
```