```
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Course: BIL570 /BIL470
```

In [4]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from dt import DecisionTreeClassifier
```

Exploratory Data Analysis (EDA)

Train the classifier

In [66]:
```
clf = DecisionTreeClassifier(max_depth=5)
```

Split dataset to train and test

In [67]:
```
X=iris.values.tolist();
y=[];
for row in X:
    y.append(int(row[4]));
    del row[4];
X=pd.Series(X);
y=pd.Series(y);
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, shu

X_train_list=X_train.values.tolist();
y_train_list=y_train.values.tolist();
X_test_list=X_test.values.tolist();
y_test_list=y_test.values.tolist();
```

Train The Classifier

In [68]:
```
clf.fit(X_train_list,y_train_list);
```

Predict Class of Test values

In [69]:
```
yhat = clf.predict(X_test_list)
print("Test Features Expected Classification")
print(y_test_list)
print("Prediction")
print(yhat);
xhat = clf.predict(X_train_list)
print("Train Features Expected Classification")
print(y_train_list)
print("Prediction")
print(xhat);
```

```
Test Features Expected Classification
[2, 0, 0, 2, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0, 2, 1, 2, 2, 2, 2, 0, 0, 2, 0,
1, 2, 0, 2]
Prediction
[2, 0, 0, 2, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0, 2, 1, 2, 2, 2, 2, 0, 0, 2, 0,
1, 1, 0, 1]
Train Features Expected Classification
[1, 2, 2, 1, 0, 0, 1, 1, 2, 2, 1, 0, 1, 0, 0, 2, 0, 0, 1, 0, 1, 2, 0, 0, 0, 0,
1, 2, 2, 2, 0, 2, 1, 2, 2, 2, 2, 2, 2, 1, 2, 2, 0, 1, 0, 1, 1, 1, 1, 0, 2, 2,
2, 0, 1, 0, 1, 1, 1, 0, 2, 2, 0, 1, 2, 0, 1, 1, 1, 0, 0, 2, 1, 2, 0, 2, 0, 2,
2, 2, 0, 0, 2, 1, 2, 1, 0, 2, 0, 1, 1, 2, 0, 1, 1, 1, 0, 2, 1, 1, 1, 1, 2, 1,
1, 1, 2, 0, 2, 0, 1, 0, 0, 0, 1, 2, 0, 2, 1, 1]
Prediction
[1, 2, 2, 1, 0, 0, 1, 1, 2, 2, 1, 0, 1, 0, 0, 2, 0, 0, 1, 0, 1, 2, 0, 0, 0, 0,
1, 2, 2, 2, 0, 2, 1, 2, 2, 2, 2, 2, 2, 1, 2, 2, 0, 1, 0, 1, 1, 1, 1, 0, 2, 2,
2, 0, 1, 0, 1, 1, 1, 0, 2, 2, 0, 1, 2, 0, 1, 1, 1, 0, 0, 2, 1, 2, 0, 2, 0, 2,
2, 2, 0, 0, 2, 1, 2, 1, 0, 2, 0, 1, 1, 2, 0, 1, 1, 1, 0, 2, 1, 1, 1, 1, 2, 1,
1, 1, 2, 0, 2, 0, 1, 0, 0, 0, 1, 2, 0, 2, 1, 1]
```

Results

Confusion Matrix of Test

Confusion Matrix of Train

F1-Score

Accuracy

Precision

Recal

Plot of ROC Curve (Test/Train) and Value of AUC (Test/Train)