

Machine Learning Lab CSE 336L

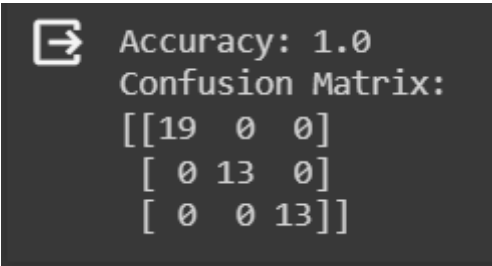
Week – 5 Decision Trees

1. Implement Decision Tree Classifier for classification of Iris dataset
 - a. Load the data set
 - b. Split the data set (70:30) to train and test sets
 - c. Train a Decision Tree using train set
 - d. Test the model using test set. Find accuracy and confusion Matrix.

Code:

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score, confusion_matrix
iris_df = pd.read_csv("/data/iris.csv")
X = iris_df.iloc[:, :-1]
y = iris_df.iloc[:, -1]
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=42)
clf = DecisionTreeClassifier()
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
conf_matrix = confusion_matrix(y_test, y_pred)
print("Confusion Matrix:")
print(conf_matrix)
```

Output:

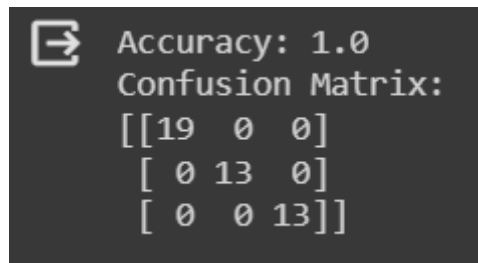


```
➤ Accuracy: 1.0
Confusion Matrix:
[[19  0  0]
 [ 0 13  0]
 [ 0  0 13]]
```

2. Implement Random Forest Classifier for classification of Iris dataset
- Load the data set
 - Split the data set (70:30) to train and test sets
 - Train a Random Forest model using train set
 - Test the model using test set. Find accuracy and confusion Matrix.

Code:

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, multilabel_confusion_matrix
iris_df = pd.read_csv("/data/iris.csv")
X = iris_df.iloc[:, :-1]
y = iris_df.iloc[:, -1]
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=42)
rf_classifier = RandomForestClassifier()
rf_classifier.fit(X_train, y_train)
y_pred = rf_classifier.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
conf_matrix = confusion_matrix(y_test, y_pred)
print("Confusion Matrix:")
print(conf_matrix)
```

Output:


```
➞ Accuracy: 1.0
Confusion Matrix:
[[19  0  0]
 [ 0 13  0]
 [ 0  0 13]]
```

Submitted By:

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