Machine learning LAB-06

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1. Implement Decision Tree Classifier for classification of Iris dataset
   a. Load the data set
   b. Split the data set 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.

```python
# 1. Implement Decision Tree Classifier for classification of
Iris dataset
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Matrix.

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

# Load the Iris dataset from CSV
iris_df =
pd.read_csv("E:\SRM\Machine_Learning\Lab\Lab-6\iris.csv")

# Split features and target
X = iris_df.drop('Species', axis=1)
y = iris_df['Species']

# Split the dataset into train and test sets
```

```python
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.2, random_state=42)

# Train a Decision Tree classifier
clf = DecisionTreeClassifier()
clf.fit(X_train, y_train)

# Test the model
y_pred = clf.predict(X_test)

# Calculate accuracy
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)

# Calculate confusion matrix
conf_matrix = confusion_matrix(y_test, y_pred)
conf_matrix_df = pd.DataFrame(conf_matrix,
columns=iris_df['Species'].unique(),
index=iris_df['Species'].unique())
print("\nConfusion Matrix:")
print(conf_matrix_df)

# Print the first few rows and column names of the DataFrame
print("DataFrame Head:")
print(iris_df.head())
print("\nColumns:", iris_df.columns)
```

```
PS E:\SRM\Machine_Learning> python -u "e:\SRM\Machine_Learning\Lab\Lab-6\ques1.p
Accuracy: 1.0

Confusion Matrix:
            setosa  versicolor  virginica
setosa          10           0          0
versicolor       0           9          0
virginica        0           0         11
DataFrame Head:
   Sepal.Length  Sepal.Width  Petal.Length  Petal.Width Species
0           5.1          3.5           1.4          0.2  setosa
1           4.9          3.0           1.4          0.2  setosa
2           4.7          3.2           1.3          0.2  setosa
3           4.6          3.1           1.5          0.2  setosa
4           5.0          3.6           1.4          0.2  setosa

Columns: Index(['Sepal.Length', 'Sepal.Width', 'Petal.Length', 'Petal.Width',
       'Species'],
      dtype='object')
PS E:\SRM\Machine_Learning>
```