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ROLL NO: 07

PRACTICAL: 6

```
import pandas as pd
from sklearn.datasets import load_breast_cancer from
sklearn.model_selection import train_test_split from
sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score, classification_report,
confusion_matrix from sklearn import tree import matplotlib.pyplot
as plt

# Load the Breast Cancer dataset
breast_cancer = load_breast_cancer()
X = breast_cancer.data y =
breast_cancer.target

# Split the data into training and testing sets (80% training, 20%
testing)
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.2, random_state=42)

# Instantiate the Decision Tree classifier
classifier = DecisionTreeClassifier()

# Train the classifier on the training set
classifier.fit(X_train, y_train)

# Make predictions on the testing set
y_pred = classifier.predict(X_test)

# Evaluate the classifier
accuracy = accuracy_score(y_test, y_pred)
conf_matrix = confusion_matrix(y_test, y_pred)
classification_rep = classification_report(y_test, y_pred)

# Display the results
print(f"Breast Cancer Dataset - Accuracy: {accuracy:.4f}")
print("\nConfusion Matrix:\n", conf_matrix)
print("\nClassification Report:\n", classification_rep)
```

```
# Visualize the decision tree
plt.figure(figsize=(16, 10))
tree.plot_tree(classifier, feature_names=breast_cancer.feature_names,
class_names=breast_cancer.target_names, filled=True)
plt.title("Decision Tree Visualization - Breast Cancer Dataset")
plt.show()
```

Breast Cancer Dataset - Accuracy: 0.9474

Confusion

Matrix:

```
[[40  3]
 [ 3 68]]
```

Classification

Report:

precision

recall f1-score

support

0 0.93

0.93

0.93

43

1 0.96

0.96

0.96

71

accuracy

0.95 114

macro avg

0.94 0.94

0.94 114

weighted avg

0.95 0.95

0.95 114

Decision Tree Visualization - Breast Cancer Dataset

