EXPERIMENT 3 : Classification with Decision Trees

AIM:

To implement a Decision Tree classifier and evaluate its performance using accuracy score and confusion matrix on a real-world dataset.

SOURCE CODE:

```
from sklearn.datasets import load_iris
from sklearn.tree import DecisionTreeClassifier, plot_tree
from sklearn.model_selection import train_test_split
from sklearn.metrics import confusion_matrix, accuracy_score
import matplotlib.pyplot as plt
import seaborn as sns
iris = load_iris()
X = iris.data
y = iris.target
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.3, random_state=42)
dt_model = DecisionTreeClassifier(criterion='gini', random_state=0)
dt_model.fit(X_train, y_train)
y_pred = dt_model.predict(X_test)
cm = confusion_matrix(y_test, y_pred)
acc = accuracy_score(y_test, y_pred)
print("Confusion Matrix:\n", cm)
print("Accuracy Score:", acc)
sns.heatmap(cm, annot=True, cmap="Blues",
xticklabels=iris.target_names, yticklabels=iris.target_names)
plt.xlabel("Predicted")
plt.ylabel("Actual")
plt.title("Confusion Matrix")
plt.show()
plt.figure(figsize=(12,8))
plot_tree(dt_model, filled=True, feature_names=iris.feature_names,
```

class_names=iris.target_names)

plt.title("Decision Tree Visualization")

plt.show()

OUTPUT: