APPLIED ARTIFICIAL INTELLIGENCE

EXPERIMENT – 07

```
from sklearn.datasets import load_wine
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import confusion_matrix, classification_report
import pandas as pd

# Load dataset
wine = load_wine()
X = wine.data
y = wine.target
class_names = wine.target_names

# Split and scale data
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
scaler = StandardScaler()
X_train_scaled = scaler.fit_transform(X_train)
X_test_scaled = scaler.transform(X_test)

# Train Random Forest Classifier
rf = RandomForestClassifier(n_estimators=100, random_state=42)
rf.fit(X_train_scaled, y_train)

# Predict and evaluate
y_pred = rf.predict(X_test_scaled)
conf_matrix = pd.DataFrame(confusion_matrix(y_test, y_pred), index=class_names,
columns=class_names)
report = classification_report(y_test, y_pred, target_names=class_names)

# Display results
```

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print("Confusion Matrix:\n", conf_matrix)

print("\nClassification Report:\n", report)

output:

```
Confusion Matrix:
          class_0  class_1  class_2
class_0        14        0        0
class_1         0       14        0
class_2         0        0        8

Classification Report:
               precision    recall  f1-score   support

     class_0       1.00      1.00      1.00        14
     class_1       1.00      1.00      1.00        14
     class_2       1.00      1.00      1.00         8

    accuracy                           1.00        36
   macro avg       1.00      1.00      1.00        36
weighted avg       1.00      1.00      1.00        36
```

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