EXPERIMENT – 15

Implement Iris Flower Classification using Naive Bayes classifier

CODE :

```python
# Iris Flower Classification using Naive Bayes

from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split

from sklearn.naive_bayes import GaussianNB

from sklearn.metrics import accuracy_score, classification_report

# Load Iris dataset
iris = load_iris()

X = iris.data

y = iris.target

# Train-test split
X_train, X_test, y_train, y_test = train_test_split(
    X, y, test_size=0.25, random_state=42
)

# Naive Bayes model
model = GaussianNB()
model.fit(X_train, y_train)

# Prediction
y_pred = model.predict(X_test)

# Output
print("Accuracy:", accuracy_score(y_test, y_pred))
print("Classification Report:\n",
    classification_report(y_test, y_pred, target_names=iris.target_names))

# Predict for new flower
new_flower = [[5.1, 3.5, 1.4, 0.2]]

prediction = model.predict(new_flower)

print("Predicted Iris Class:", iris.target_names[prediction[0]])
```

OUTPUT :

```
Accuracy: 1.0
Classification Report:
              precision    recall  f1-score   support

      setosa       1.00      1.00      1.00        15
  versicolor       1.00      1.00      1.00        11
   virginica       1.00      1.00      1.00        12

    accuracy                           1.00        38
   macro avg       1.00      1.00      1.00        38
weighted avg       1.00      1.00      1.00        38

Predicted Iris Class: setosa
>>>
```