EXPERIMENT – 16

Compare different types Classification Algorithms and evaluate their performance.

CODE :

```
# Comparison of Classification Algorithms using Iris Dataset

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

from sklearn.metrics import accuracy_score

from sklearn.linear_model import LogisticRegression

from sklearn.neighbors import KNeighborsClassifier

from sklearn.naive_bayes import GaussianNB

from sklearn.tree import DecisionTreeClassifier

from sklearn.svm import SVC

from sklearn.ensemble import RandomForestClassifier

# Load 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

)

# Models to compare

models = {

    "Logistic Regression": LogisticRegression(max_iter=1000),

    "KNN": KNeighborsClassifier(n_neighbors=5),

    "Naive Bayes": GaussianNB(),

    "Decision Tree": DecisionTreeClassifier(random_state=42),

    "SVM": SVC(kernel="linear"),

    "Random Forest": RandomForestClassifier(n_estimators=100, random_state=42)
```

}

Train, predict and evaluate

print("Model Performance Comparison:\n")

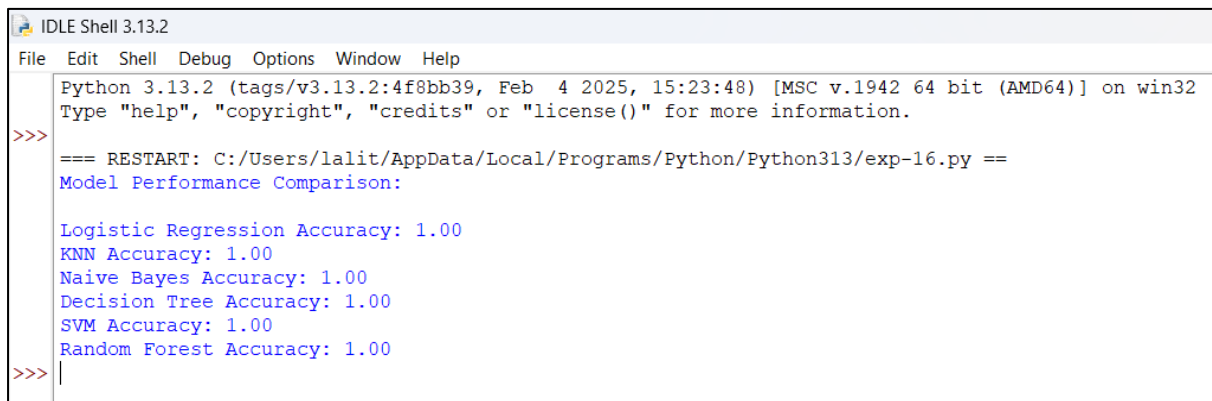for name, model in models.items():

   model.fit(X_train, y_train)

   y_pred = model.predict(X_test)

   acc = accuracy_score(y_test, y_pred)

   print(f"{name} Accuracy: {acc:.2f}")

OUTPUT :

```
IDLE Shell 3.13.2
File  Edit  Shell  Debug  Options  Window  Help
    Python 3.13.2 (tags/v3.13.2:4f8bb39, Feb  4 2025, 15:23:48) [MSC v.1942 64 bit (AMD64)] on win32
    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    === RESTART: C:/Users/lalit/AppData/Local/Programs/Python/Python313/exp-16.py ==
    Model Performance Comparison:

    Logistic Regression Accuracy: 1.00
    KNN Accuracy: 1.00
    Naive Bayes Accuracy: 1.00
    Decision Tree Accuracy: 1.00
    SVM Accuracy: 1.00
    Random Forest Accuracy: 1.00
>>>
```