

<b>EX.NO:6</b>	<b>Building a logistic regression model to predict student performance outcomes</b>
<b>DATE:</b>	

**AIM:**

To build a logistic regression model using Python to predict student performance outcomes based on input data.

**ALGORITHM:**

- Step 1: Import the required libraries.
- Step 2: Load the student dataset with features (e.g., study hours, attendance).
- Step 3: Split the data into training and testing sets.
- Step 4: Apply Logistic Regression() from sklearn.
- Step 5: Train the model using fit().
- Step 6: Predict outcomes using predict().
- Step 7: Evaluate using accuracy\_score, confusion\_matrix.

**PROGRAM:**

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score, confusion_matrix

data = {
    'Hours_Studied': [5, 3, 8, 2, 7, 4],
    'Attendance': [1, 1, 1, 0, 1, 0],
    'Passed': [1, 0, 1, 0, 1, 0]
}

df = pd.DataFrame(data)
X = df[['Hours_Studied', 'Attendance']]
y = df['Passed']

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,
random_state=42)
model = LogisticRegression()
model.fit(X_train, y_train)
y_pred = model.predict(X_test)

print("Model Accuracy:", accuracy_score(y_test, y_pred))
print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred))
print("\n--- Predict Student Performance ---")
```

```

try:
    hrs = float(input("Enter hours studied: "))
    att = int(input("Enter attendance (1 for Present, 0 for Absent): "))
    user_input = pd.DataFrame([[hrs, att]], columns=['Hours_Studied',
'Attendance'])
    prediction = model.predict(user_input)

    if prediction[0] == 1:
        print("Prediction: The student is likely to PASS.")
    else:
        print("Prediction: The student is likely to FAIL.")
except ValueError:
    print("Invalid input! Please enter numeric values only.")

```

### **RESULT:**

The logistic regression model was successfully built and used to predict student performance outcomes with calculated accuracy.

### **EXERCISE:**

1. Load a CSV file containing student data and apply logistic regression.
2. Add more features like 'Previous Scores' or 'Assignment Completion' to improve prediction.
3. Plot the decision boundary using matplotlib.
4. Evaluate the model using precision, recall, and F1-score.