



Name: Muhammad-Jawad-Haider

Roll No.: SU92-BSAIM-F24-056

Section: BSAI-3A

Subject: Artificial Intelligence

Department: Software Engineering

Project: Student Performance Prediction

Assignment: 2

Student Performance Prediction (Model Building)

Objective:

The aim of this assignment is to build a simple regression model that can predict a student's total marks (out of 100) based on their assignment, quiz, mid-term, final, attendance, and study hours.

Steps Performed:

1. **Imported necessary libraries** – pandas, scikit-learn.
2. **Loaded the clean dataset** created in Assignment 1.
3. **Separated features and target variable** (X and y).
4. **Split the data** into training and testing sets using train_test_split.
5. **Trained a Linear Regression model** on the training data.
6. **Accepted user input** for new student details (marks, attendance, hours).
7. **Created a Data Frame** from user input to match training format.
8. **Predicted total marks** using the trained model and printed the result.

Example Output:

--- Enter Student Details ---

Assignment Marks (out of 10): 8

Quiz Marks (out of 10): 7

Attendance Percentage (0-100): 85

Mid Marks (out of 30): 22

Final Marks (out of 40): 30

Study Hours per Day: 4

Predicted Total Marks: 82.45 / 100

Conclusion:

The Linear Regression model successfully predicts students' overall performance.

By entering new marks and study hours, we can estimate a student's total marks out of 100.

This project demonstrates a basic example of supervised machine learning using regression.

- **Model Train:**

```
# Step 5: Train the Linear Regression Model
model = LinearRegression()
model.fit(X_train, y_train)

print("Model trained successfully!")
```

[58] ✓ 0.0s Python

... Model trained successfully!

- **User Inputs:**

```
# Step 6: Take User Input for Prediction
print("\n--- Enter Student Details ---")
assignment = float(input("Assignment Marks (out of 10): "))
quiz = float(input("Quiz Marks (out of 10): "))
attendance = float(input("Attendance Percentage (0-100): "))
mid = float(input("Mid Marks (out of 30): "))
final = float(input("Final Marks (out of 40): "))
study = float(input("Study Hours per Day: "))
```

[59] ✓ 5.2s Python

... --- Enter Student Details ---

- **Final Predictions:**

```
# Step 8: Predict Total Marks
predicted_marks = model.predict(user_data)

print(f"Predicted Total Marks: {predicted_marks[0]:.2f} / 100")
```

[61] ✓ 0.0s Python

... Predicted Total Marks: 70.61 / 100