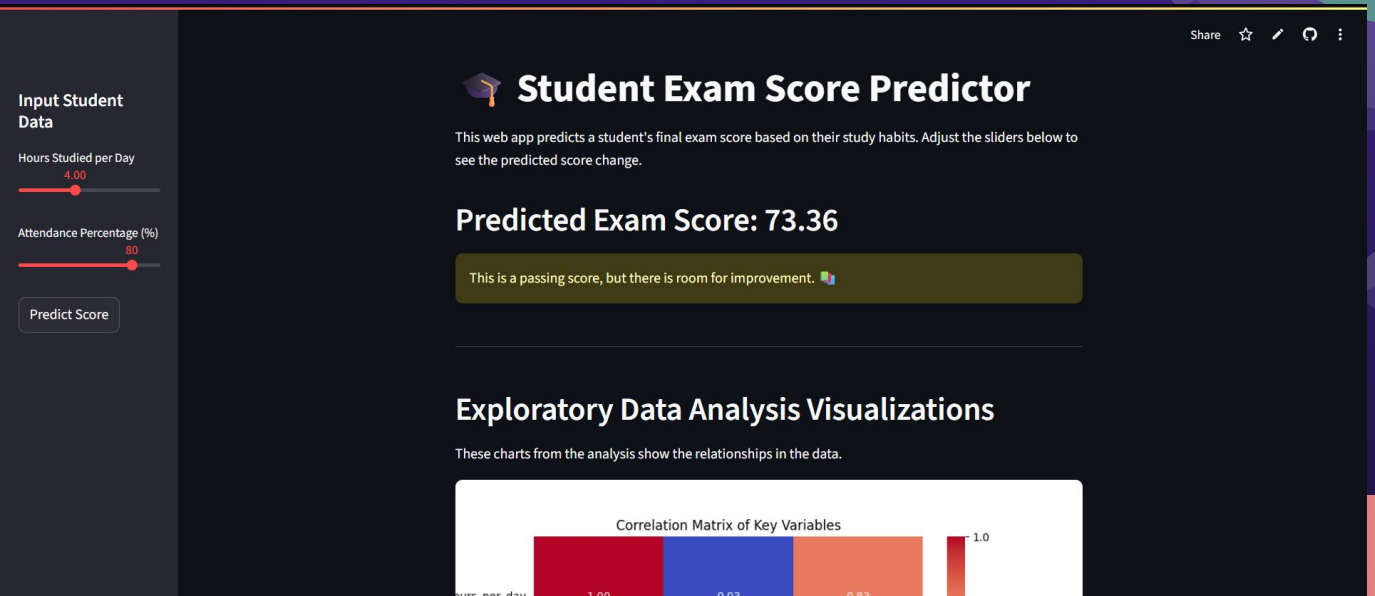
Student Score Predictor

A Statistical Analysis of Study Habits and Academic Performance to Predict Exam Score.



- Sahil Kesharwani

Project Objective & Problem Statement

❑ Project Objective

To develop a statistical model that accurately predicts a student's final exam score based on their daily study hours and class attendance percentage.

❑ Problem Statement

- **Uncertainty in Impact:** Students and educators lack a clear, quantitative understanding of which habits most significantly impact academic results.
- **Lack of Predictive Insight:** It is difficult to forecast a student's potential academic outcome based on their current behavior, making timely interventions challenging.
- **Need for Actionable Data:** A simple, accessible tool is required to translate student data into straightforward, actionable insights.

The Python Data Workflow

Our project follows a complete, end-to-end data workflow:

1. **Data Processing**

   Loaded and prepared the student_performance_dataset.csv using the **Pandas** library.

2. **Statistical Analysis & Visualization**

   Uncovered key trends and correlations using **Matplotlib** & **Seaborn**.

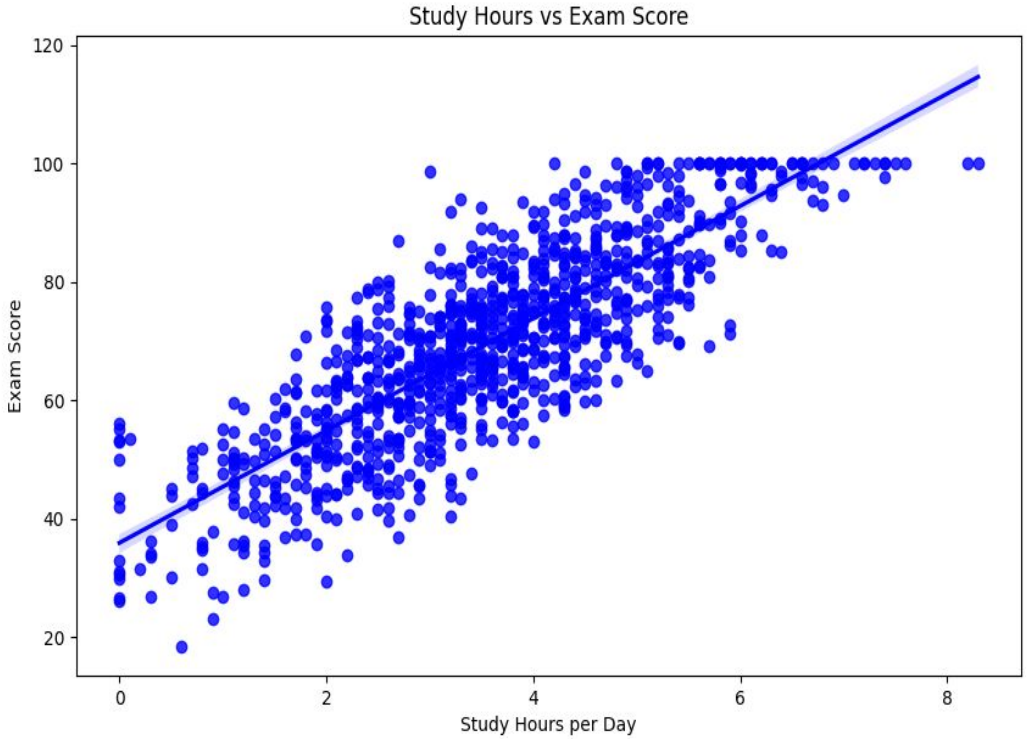
3. **Model Development**

   Built and trained a predictive model with **Scikit-learn**.

4. **Interactive Application**

   Deployed a user-friendly dashboard using **Streamlit**.

What the Data Revealed



A strong positive correlation of 0.83 exists between daily study hours and final exam score.

In this dataset, daily study time is the most powerful predictor of academic performance.

Building the Predictive Engine

A **Linear Regression** model was selected for its proven effectiveness in predicting continuous numerical outcomes.

➢ **Model Inputs (Features):**

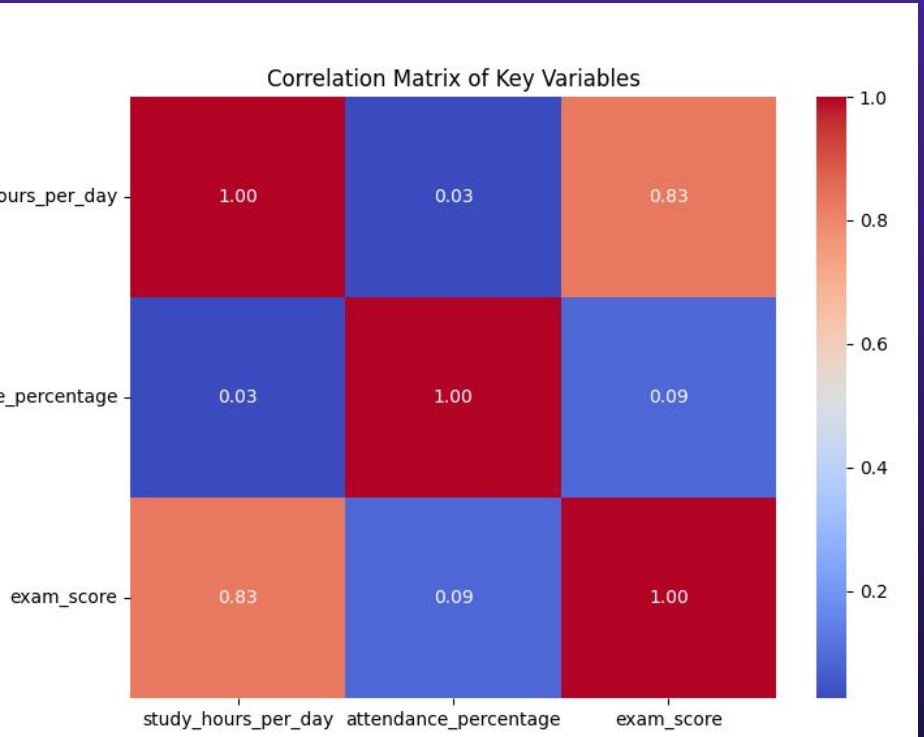
- study_hours_per_day
- attendance_percentage

➢ **Model Output (Target):**

- exam_score

The dataset was split into training (80%) and testing (20%) sets to ensure the model's performance was validated on unseen data.

Measuring Predictive Accuracy



R-squared (R^2): 0.66

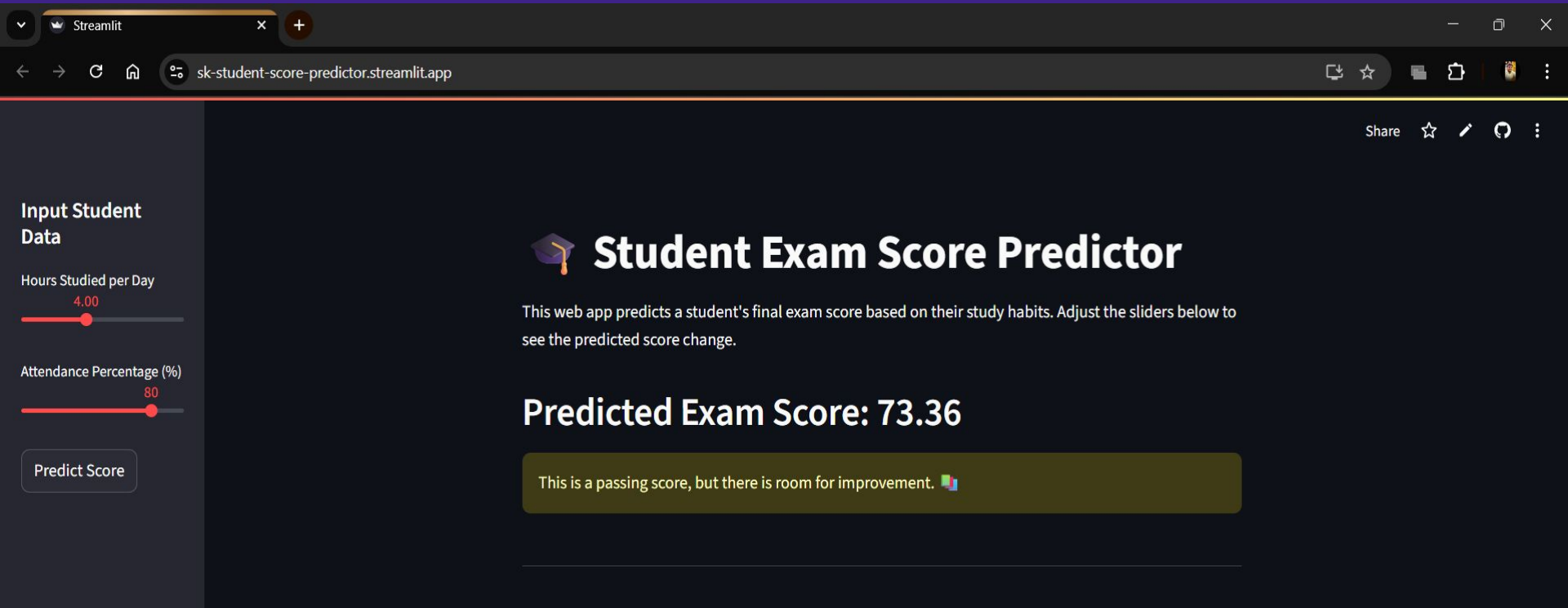
The model successfully explains 66% of the variability in student exam scores, indicating a good fit.

Mean Absolute Error (MAE): 7.43

On average, the model's prediction is off by only ~7.4 points, demonstrating strong reliability.

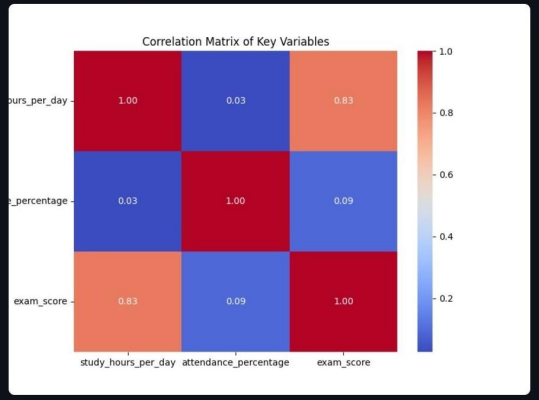
A Tool for Real-Time Prediction

[Click Here To Open The Live Web App]

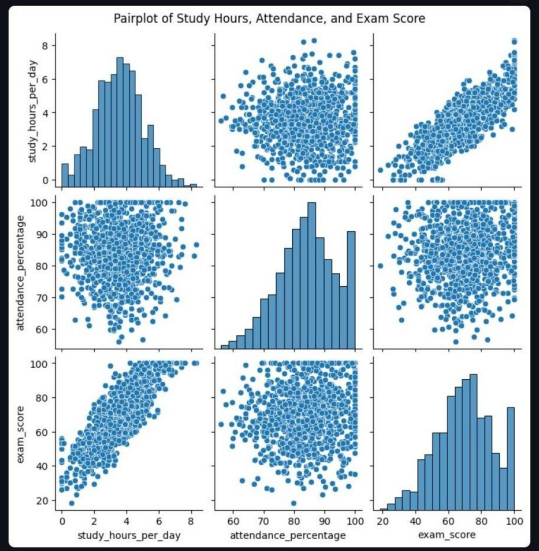


Exploratory Data Analysis Visualizations

These charts from the analysis show the relationships in the data.



Correlation Matrix of Key Variables

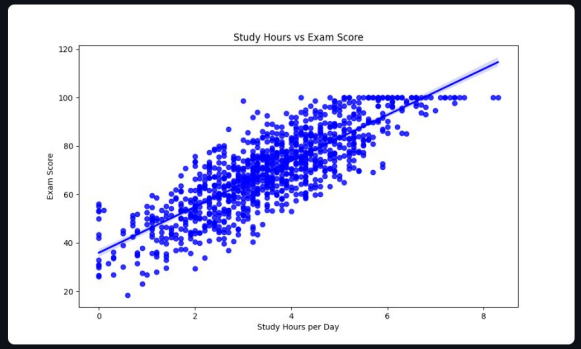


Pairplot of Key Variables

★ **User-Friendly Interface:** Allows users to input student data using simple, intuitive sliders.

★ **Instant Feedback:** Provides real-time score predictions based on the input data.

★ **Technology:** Built with the **Streamlit** framework.



Scatter Plot of Study Hours vs. Exam Score with Regression Line

Created by Sahil Kesharwani

For any questions or feedback, please contact: [sahil.kesharwani.927@gmail.com]

Responsible Application of Data

Holistic View

This model is a tool for insight, not a complete judgment. It should be used to support and guide students, acknowledging it doesn't capture all factors like teaching quality or student well-being.

Data Representativeness

Conclusions are based on the available dataset, which may not represent all student demographics equally.

Avoiding Misuse

The tool is intended for motivational and educational purposes, not for making definitive assessments or creating labels for students.

Conclusion & Project Links

Summary

- **Objective Achieved:** Successfully developed a statistical model to predict student exam scores with a high degree of validated accuracy.
- **Key Insight Confirmed:** Daily study hours were identified as the most significant predictor of academic success in this dataset.
- **Functional Tool Delivered:** A fully interactive and user-friendly web application was built and deployed, providing a practical tool for data-driven academic insight.

Access the Project

- GitHub Repository: https://github.com/Sahil2055/Student_Score_Predictor
- Live Web App: https://sk-student-score-predictor.streamlit.app/

Thank You!

For more information or questions, please contact.