🎓 Project Title: Student Grade Prediction using Machine Learning and Flask

This project focuses on building and deploying a machine learning model to predict students' final grades (G3) using academic and behavioral features. The dataset used for this project is the Student Performance dataset (student-por.csv), which contains various attributes related to students' academic performance.

🎯 Objective

The objective of this project is to:

- Train a regression model to predict final grade (G3)
- Save the trained model
- Integrate the model into a Flask web application
- Deploy a simple user interface for real-time predictions

🧹 Data Preprocessing

The dataset was cleaned and selected relevant numerical features:

- G1 (First period grade)
- G2 (Second period grade)
- Study Time
- Failures
- Absences

The target variable used was:

- G3 (Final Grade)

Model Training

A regression model was trained using scikit-learn. The dataset was split into training and testing sets. After training, the model was evaluated and then saved using the pickle library for deployment.

Model Deployment

The trained model was integrated into a Flask application. The application includes:

- A homepage with an HTML form
- Input fields for required features
- A POST request handling route
- Dynamic prediction display

The application runs locally at:

http://127.0.0.1:5000

Result

The model successfully predicts student final grades based on user input. Predictions are displayed dynamically on the webpage.

Technologies Used

- Python
- Pandas
- Scikit-learn
- Flask
- HTML
- Pickle
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Conclusion

This project demonstrates end-to-end machine learning workflow including data preprocessing, model training, saving the model, and deploying it using Flask. It highlights how machine learning models can be converted into real-world usable applications.