**Project Title: Student Performance Prediction**

**Objective**

The goal of this project is to predict a student's final marks based on several features such as grades, study habits, parental education, and more. This project employs a machine learning model (Support Vector Regression) to provide accurate predictions.

**Key Features Used**

The following features were selected as inputs for the prediction model:

1. **G2**: Second period grades.
2. **Failures**: Number of past failures.
3. **Absences**: Total number of absences.
4. **Fedu**: Father’s education level.
5. **Study Time**: Hours spent studying weekly.
6. **School Support**: Whether the student receives school support.
7. **Higher Education Aspiration**: Whether the student aims for higher education.
8. **Internet Access**: Whether the student has internet access.

**Steps Involved**

1. **Data Collection and Preprocessing**:
   * The dataset containing student information was analyzed and preprocessed.
   * Missing values were handled, and categorical data was encoded.
2. **Model Training**:
   * A Support Vector Regression (SVR) model was trained on the data.
   * Hyperparameter tuning was performed to optimize the model's performance.
3. **Model Evaluation**:
   * The model was tested on unseen data, and performance metrics were calculated to ensure accuracy.
4. **Building a User Interface**:
   * A Gradio interface was developed to allow users to input the features and receive predictions for the student's final marks.
5. **Deployment**:
   * The Gradio app was tested locally, and instructions for deploying on Hugging Face Spaces were provided.

**Technologies Used**

* **Python Libraries**: pandas, numpy, scikit-learn, joblib, gradio.
* **Tools**: Gradio for creating the interface and Hugging Face for potential deployment.

**Conclusion**

This project successfully demonstrates how machine learning can be applied to predict student performance. The trained SVR model provides accurate predictions based on the selected features. The interactive interface allows for easy and efficient use by educators, parents, or policymakers to assess and improve student outcomes.

Future improvements could include:

* Adding more features to enhance prediction accuracy.
* Integrating the app with a database for real-time predictions.
* Deploying the app on a cloud platform for wider accessibility.

**Github** **Link**: https://github.com/RedDaredevils/Data-Science-Project-Student-s-Performance-Prediction-/blob/main/Students%20Final%20Grade%20Prediction.ipynb