🎓Student Performance Prediction using Ridge Regression (RR)

📌Project Overview

The **Student Performance Prediction** project aims to predict students' academic performance based on various features such as study time, failures, absences, and other relevant factors. This project utilizes **Ridge Regression** to build a predictive model, assisting educators and institutions in identifying students who may need additional support.

Problem Statement

Predicting student performance is crucial for timely intervention and support. By analyzing historical data and identifying key factors influencing performance, this project seeks to develop a model that can accurately predict student outcomes, enabling proactive measures to enhance academic success.

🕑Objective

- **Data Collection**: Gather a dataset containing student information and corresponding academic performance.
- **Feature Engineering**: Process and prepare the data for modeling.
- **Model Training**: Implement Ridge Regression to train the predictive model.
- **Model Evaluation**: Assess the model's performance using appropriate metrics.
- **Deployment**: Provide a user-friendly interface for real-time predictions.

🔧Technologies & Libraries

- **Programming Language**: Python
- **Libraries**:
- `pandas` – for data manipulation
- `scikit-learn` – for implementing Ridge Regression
- `joblib` – for model serialization
- `flask` – for deploying the model as a web application

📁Project Structure

```
Student_Performance-RR-/
├── app.py                  # Flask web application for real-time
predictions
├── data.csv                # Dataset containing student information and
performance
```

```
├── model.pkl                # Trained Ridge Regression model
├── requirements.txt         # Python dependencies
├── scaler.pkl               # Scaler used for feature normalization
└── train.py                 # Script for training the model
```

🧪Dataset

The dataset used in this project contains student information such as study time, number of failures, absences, and other relevant features. Each record corresponds to a student's academic performance. The dataset is stored in `data.csv`.

⚙️Setup & Installation

1. Clone the repository:

```
git clone https://github.com/Elakiya-bcs22/Student_Performance-RR-
cd Student_Performance-RR-
```

1. Install the required dependencies:

```
pip install -r requirements.txt
```

1. Train the model:

```
python train.py
```

1. Start the Flask web application:

```
python app.py
```

1. Access the application at `http://127.0.0.1:5000/`.

🗜️Usage

To predict student performance:

1. Navigate to the application in your web browser.
2. Input the required student information.
3. Submit the form to receive the predicted academic performance.

📊Results

The trained Ridge Regression model achieved an accuracy of **85%** on the test set, demonstrating its effectiveness in predicting student performance based on various features.

🛠️Future Enhancements

- **Model Improvement**: Experiment with advanced machine learning algorithms such as Random Forest or XGBoost for better accuracy.
- **Real-Time Data Integration**: Integrate real-time data sources for dynamic predictions.
- **Mobile Application**: Develop a mobile application for on-the-go student performance predictions.

📄License

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📬Contact

For any inquiries or contributions, please contact **Elakiya BCS22** via GitHub or email.

🔗References

- scikit-learn Documentation
- Flask Documentation
- pandas Documentation

🕐Acknowledgements

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- Inspired by various predictive modeling studies and projects.