Task Description

Title: Time Series Prediction using Deep Learning

Objective:
Develop a predictive model using a deep learning framework (TensorFlow or PyTorch) to forecast future sales from historical time series data. You are to select a deep learning algorithm of your choice to accurately predict future time steps.

Responsibilities:
- Conduct exploratory data analysis and preprocessing on the provided time series dataset.
- Choose and implement an appropriate deep learning model for time series forecasting.
- Train, validate, and optimize your model to achieve the highest accuracy.
- Compile a comprehensive report documenting your methodology, results, and insights.

Dataset Explanation

Dataset Name: Retail Sales Time Series

Format: CSV

Description:
The dataset consists of monthly sales data from a major retail chain for the years 2015 to 2020, including:
- **Month**: Month of the sales data record.
- **Sales**: Total sales value in USD.

Challenges:
- Addressing potential seasonal effects and anomalies.
- Handling any missing or inconsistent data entries.

Model Requirements

Frameworks: TensorFlow or PyTorch

Model Type: Candidate's Choice
- Options include, but are not limited to, RNN, LSTM, GRU. You are encouraged to select the model that best suits the forecasting task.

Evaluation Criteria

Metrics:
- Root Mean Square Error (RMSE)
- Mean Absolute Error (MAE)
- Coefficient of Determination (R^2)

Deliverables:
- Python scripts for preprocessing, modeling, training, and evaluation.
- A detailed report outlining your choice of model, methodologies used, and key findings.

Submission Guidelines

Organization:

- **Code Folder**: Contains all Python scripts.
- **Model Folder**: Includes the saved model files.
- **Dataset Folder**: Houses the dataset file.
- **Documentation**: A detailed PDF report.

Deadline: 10 days from today

Delivery:

Submit all the work as a single package via a GitHub repository. Ensure that all parts of the project are well-organized within the repository:

- The **Code** folder should contain all your scripts.
- The **Model** folder should have the saved model files.
- The **Dataset** folder is for the dataset file.
- A comprehensive PDF report should be included in the root of the repository.

Interview:

Post submission, be prepared for an online interview where you will discuss your code and findings in detail.