Time Series Challenge Assignment

Description

You are provided with two CSV files: one containing the training dataset and the other for testing. Your task is to forecast the oil temperature (OT) of electricity transformers for each hour.

Problem Context

Electric power distribution involves supplying electricity to various areas, but predicting the demand for specific areas is challenging due to factors such as weekdays, holidays, seasons, weather, and temperatures. Inaccurate predictions can lead to equipment damage or unnecessary energy waste.

Oil temperature is a critical indicator of a transformer's condition. Accurately forecasting the oil temperature can help manage the load on transformers, prevent damage, and optimize energy distribution.

Your challenge is to build a machine learning model to forecast the oil temperature for the next 24 hours, predicting values at 1-hour intervals. Additionally, explore the dataset to gain insights and evaluate the extreme load capacity.

Data Fields

Field	Description
date	The recorded date
HUFL	High Useful Load
HULL	High Useless Load
MUFL	Middle Useful Load
MULL	Middle Useless Load
LUFL	Low Useful Load
LULL	Low Useless Load
OT	Oil Temperature (Target)

Requirements:

- Include appropriate data preprocessing steps, such as handling missing values, scaling, or normalizing the data. Justify the choice of preprocessing techniques.

- Perform feature engineering to create additional features that could improve the model's performance. Explain the rationale behind the new features.
- Build a Deep Learning or Machine Learning model to forecast OT for the next 24 hours.
- Explore and provide insights into the dataset.
- Include docstrings in all functions and classes, explaining their purpose and usage. The README file should also document the project structure, dependencies, and any assumptions made.

Note:

- Do not use any pre-trained models for forecasting.
- Avoid using AI models for the task.

Tips

- Add meaningful comments to your code to enhance clarity and understanding.
- Make sure your code is well-structured and documented.

Submission Guidelines

- Share a link to a Git repository (e.g., GitHub, GitLab, Bitbucket) containing your project.
- Include a README file with clear instructions on how to run the project.