Assignment 6.1

Problem Statement

Time Series Forecasting using LSTM

Data:

https://www.kaggle.com/datasets/shenba/time-series-datasets

Use any one series out of four available.

Task:

1. Read the time series and apply scaling on the data
2. Split the data into the training and testing set.
3. Create the batches of time series using Tensorflow TimeseriesGenerator with appropriate length.
4. Design the LSTM model with optimal layers and units
5. Compare forecasted and actual time series on the testing set.

Assignment 6.2

Write a report on how to use Convolution and Pooling on 1D data for time series. Explain the process with the help of model design.

Assignment 6.3

Problem Statement

Multivariate time series forecasting on India's foreign currency rates using LSTM

Data:

Uploaded in teams.

File contains 4 currency rates, US Dollar (USD), Pound Sterling (GBP), Japanese Yen (JPY) and Euro (EUR) from the period January 1999 to July 2020.

Task:

1. Read and preprocess the file.
2. Plot the correlation, and provide your inference.
3. Apply scaling on these currency rates.
4. Split the data into the training and testing set,
    a. Training: 1999-2018
    b. Testing: 2019-2020
5. Create the batches of time series using Tensorflow TimeseriesGenerator with length as 180 days (6-months window).
6. Design the Conv1D-LSTM model with optimal layers and units,
    a. Add pooling 1D after convolution
    b. Add few dense layers
    c. Set optimizer as RMSProp
7. Individually forecast and compute MAE for each currency rate.