

OMDENA ALGERIA GREEN MINI PROJECT – TEAM 1

WATER LEVEL FORECASTING

Group members

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Problem Statement

Objective

Venezia is an Italian city built on a lagoon, a body of water separated from the sea by a strip of land. However, this city is frequently subject to flooding during autumn and spring due to the "acqua alta", a tide that raises the water level to the point that the sea invades the city. This phenomenon causes great complications in the city. The forecast of the water level is therefore a fundamental task for the safeguard of the city of Venezia.

Dataset & Data Description

The dataset contains hourly measurements of the water level in Venezia from 1983-01-01 to 2016-01-01.

To load the dataset, use the following link: <https://www.kaggle.com/datasets/lbronchal/venezia>

Data Description:

Attribute Information:

- datetime: date and hour of the measurement in utc time
- level: level of the water in cm from the reference point

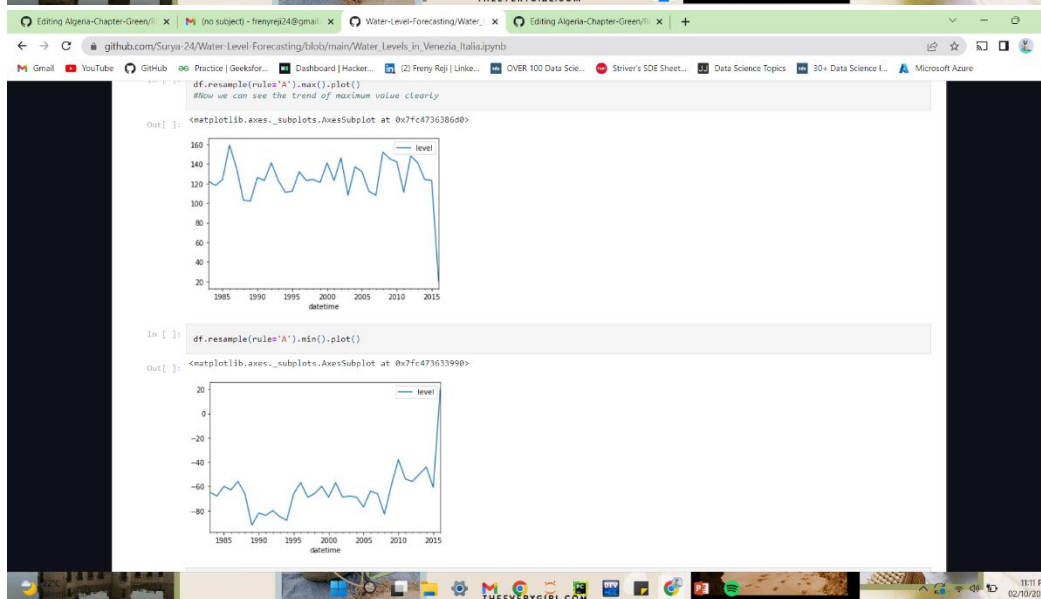
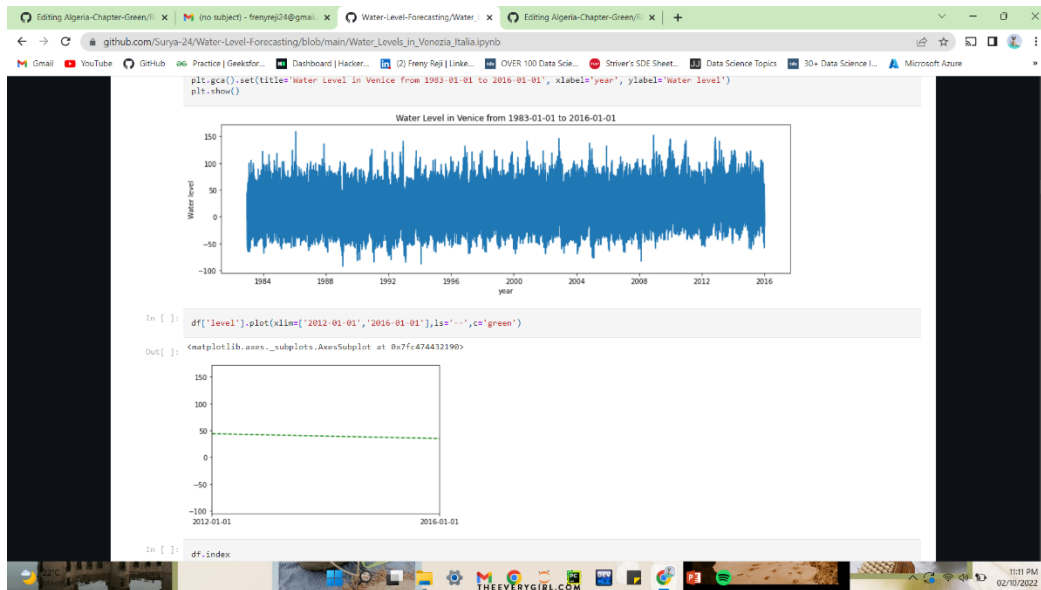
Proposed Work:

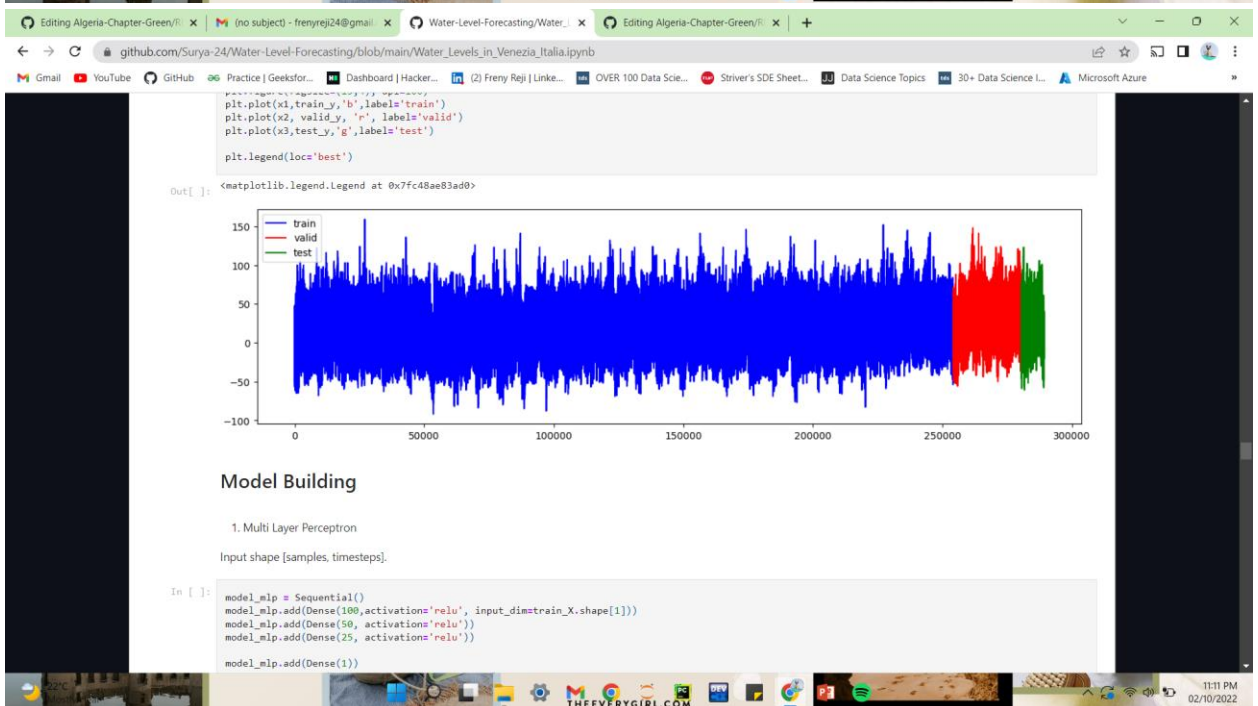
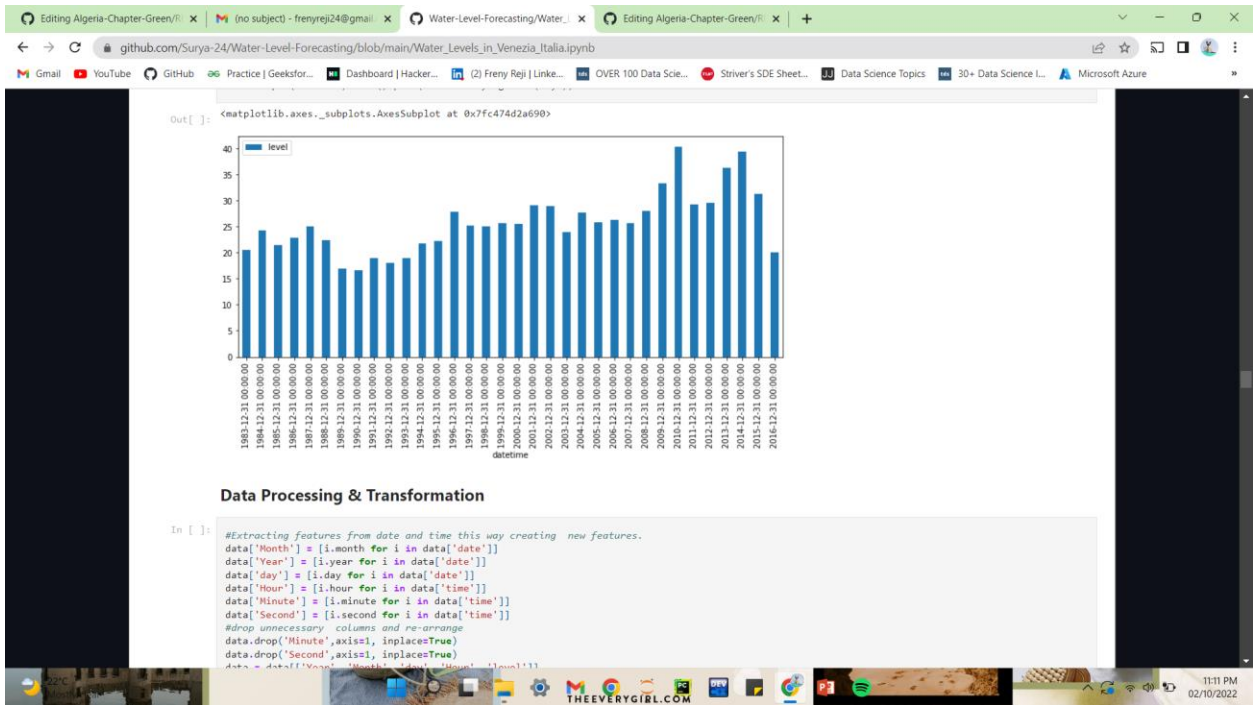
1. Load data
2. EDA implementation
3. Data Processing & Transformation
4. Preparation of Train, Valid and Test datasets
5. Build, Train & Evaluate the model

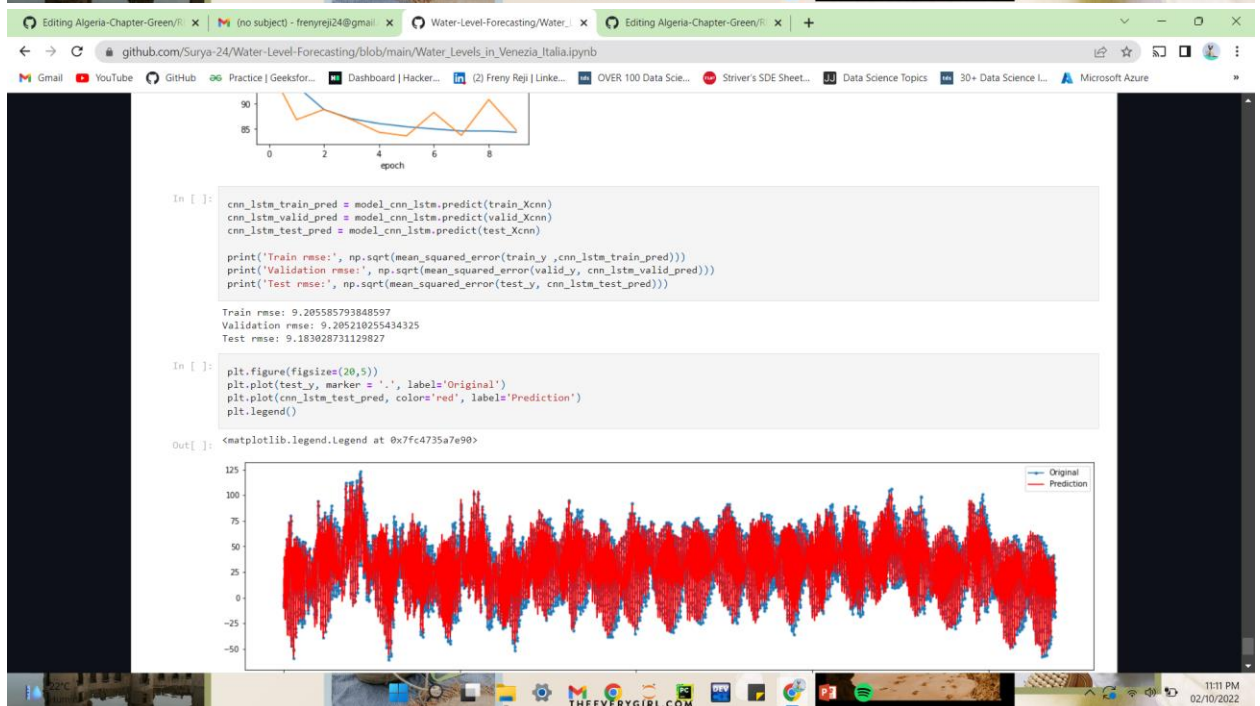
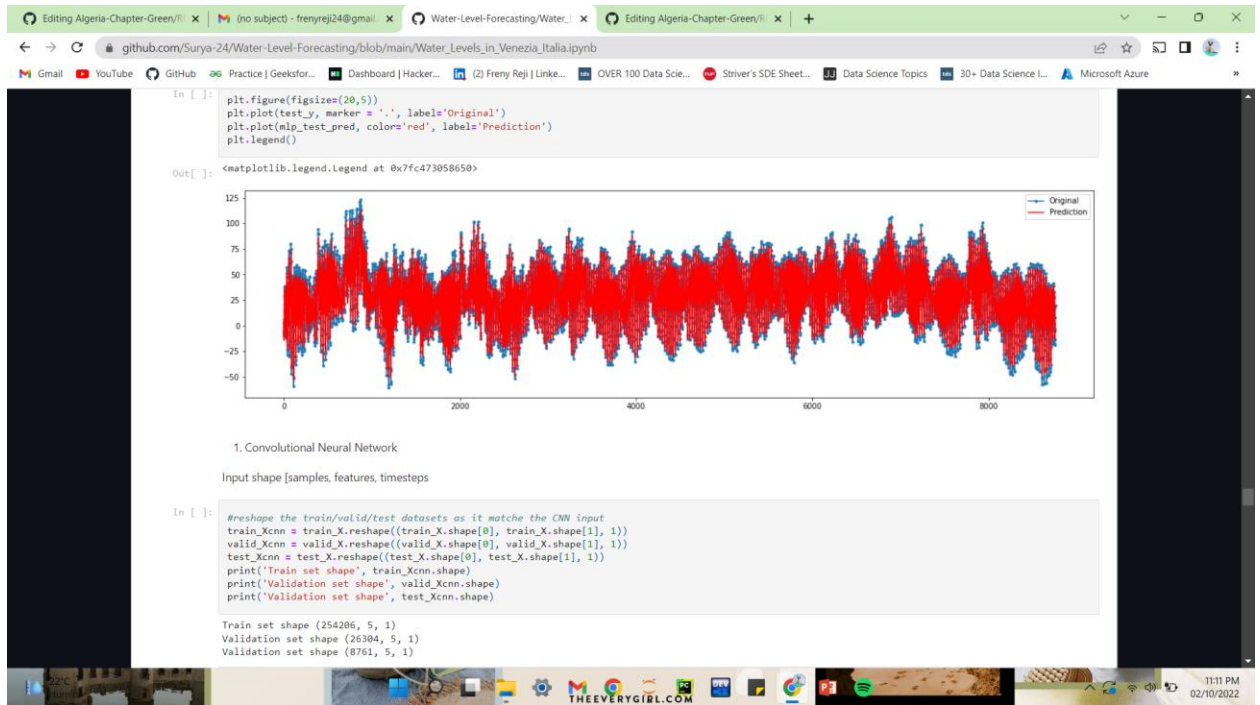
Individual Tasks:

1. Freny Reji – **Exploratory Data Analysis , Model Selection , added /made contents in github , video editing.**
2. Mada Sai Surya(Team Leader) – **Exploratory Data Analysis , Data Modelling , Model Training, video editing.**
3. Djazila Souhila Korti – **Data Collection , Data Preprocessing , Data Modelling , Hyperparameter tuning .**

Results:







CONCLUSION:

The capability of different machine learning models such as the Multi Layer Perceptron (MLP), Long Short Term Memory (LSTM), Convolution Neural Network (CNN), CNN LSTM was investigated for the prediction of water level at a river in Venezia , Italy. Four different input scenarios were investigated, considering correlation analysis. Generally, the comparison of several data-driven regression methods indicated that the exponential GPR model offered better accuracy in predicting daily water levels with respect to different assessment criteria. The findings of this study show the success of the GPR model in capturing the changes in the water level of a river; thus paving the way for which the model can be used in works to mitigate potential risk that may occur in the future from natural events.