Abstract: Weather Forecasting Using Machine Learning

Weather forecasting plays a crucial role in various sectors, including agriculture, disaster management, transportation, and daily life planning. Traditional forecasting methods rely on statistical and numerical models, which often require extensive computation and domain expertise. However, with the advancement of machine learning, more accurate and efficient prediction models can be developed.

This project aims to leverage machine learning techniques to analyse historical weather data and predict future weather conditions such as temperature, humidity, wind speed, and precipitation. Using algorithms like **linear regression**, etc the model identifies patterns and trends in meteorological data. The dataset, obtained from reliable sources such as **NOAA** or **local weather stations**, is pre-processed to handle missing values, normalize features, and improve prediction accuracy.

The proposed system includes a **Flask-based web application** with an **HTML and JavaScript frontend**, allowing users to input location details and receive real-time weather predictions. The integration of a user-friendly interface enhances accessibility and usability.

By implementing a data-driven approach, this weather forecasting system improves prediction accuracy and provides an efficient alternative to conventional forecasting methods. Future enhancements may include integrating **deep learning models** and **real-time data processing** for even better performance.