**Subject: Introduction to Machine Learning**

**Subject Code: CSE663 TR1**

**Semester: B.Tech CSE 3rd**

**Assignment 1**

**Problem : Time Series Forecasting with Missing Data**

**Prompt:**

* **Dataset:** A time series dataset with missing data points.
* **Task:** Predict future values of the time series.

**Questions:**

* **Imputation:** Discuss different methods for handling missing data in time series (e.g., mean imputation, interpolation, time series forecasting models).
* **Feature Engineering:** Explore techniques to create new features from the time series data, such as lagged values, moving averages, and seasonal components.
* **Model Selection:** Compare the performance of various time series forecasting models (e.g., ARIMA, SARIMA, LSTM, Prophet) on the dataset. Evaluate using metrics like RMSE, MAE, and MAPE.
* **Hyperparameter Tuning:** How would you tune the hyperparameters of your chosen model to optimize its performance on the time series data?