TSA Lab Objectives.

1. Exploratory data analysis of time series data.
2. Handling missing values in data using: Forward fill method (Last observation carried forward), Backward fill method (Next observation carried backwards), Linear interpolation, Spline interpolation, Seasonal decomposition and interpolation.
3. Decompose Time-Series to See Components (Trend, Seasonality, Noise, etc), Dicky-Fuller Test for Stationarity, Remove Trend (Logged Transformation, Power Transformation, Applying Moving Window Functions, Applying Moving Window Function on Log Transformed Time-Series, Applying Moving Window Function on Power Transformed Time-Series, Applying Linear Regression to Remove Trend)
4. To Remove Seasonality (Differencing Over Log Transformed Time-Series, Differencing Over Power Transformed Time-Series, Differencing Over Time-Series with Rolling Mean taken over 12 Months, Differencing Over Power Transformed & Mean Rolled Time-Series, Differencing Over Linear Regression Transformed Time-Series), ), Dicky-Fuller Test for Stationarity
5. Implementation of Auto regression (AR) model, and using Auto correlation function (ACF) to find the order of AR model.
6. Implementing Autoregressive integrated moving average (ARIMA) model, also implement Auto- ARIMA model.
7. Implementing Random Forest Regressor Model for time series Forecasting
8. Implementing 1D CNN for time series Forecasting
9. Implementation of multivariate forecasting using Vector AutoRegressive (VAR) model
10. Time series forecasting using Recurrent neural network (RNN) and LSTM (Long short term memory)