The Blue Sky Challenge

Sub-theme 2: Blue Sky Below

Forecasting Sensor Measurements in Smart Air Aquality Monitoring System

Prediction Model: Fbprophet

Libraries Used

1) Fbprophet

2) Pandas

3) Numpy

4) Matplotlib

Problem Statement: Temporal forecasting of temperature and Carbon Monoxide (CO) sensor data one day ahead. Data Preprocessing Ran the preprocessing.py on the original dataset to get the current dataset which Is present in the source code.

Handling -200 For -200 values we first replaced it with 0 and calculated the average of the column , and after that we fill the mean to the index where -200 were pressent.

Model Training and Prediction For using the fbprophet for Time Series forecasting We Combined Datatime as 2004-03-10 18:00:00.

The fbprophet requires ds,y values for training, where

1) ds is DateTime.

2) y is parameters For Our Work (Temperature,CO) .

We Have Created A Function , So we donot have to create model object again and again So our Work give a performance boot for large forecasting data.

For Temperature

As Per Challenge We Train the model with 11-17 and predict for 18,our MAPE is 11.960792827071014

then we created a loop in which put day 18 in our train dataset and using Function(Without making new Prophet object) we ran next testing period (8th day to 14th day) and add previous data to train data and our MAPE are as:-

1) 11.960792827071014

2) 25.518980744317115

3) 10.90374649693034

4) 9.674374313900719

5) 12.240047775525849

6) 34.05925996026924

7) 20.576396405272774

and the Average of MAPE for the testing period (8th day to 14th day)

17.84765693189815

For CO

As Per Challenge We Train the model with 11-17 and predict for 18,our MAPE is 52.856274584542

then we created a loop in which put day 18 in our train dataset and using Function(Without making new Prophet object) we ran next testing period (8th day to 14th day) and add previous data to train data and our MAPE are as:-

1) 52.85627458454238

2) 41.74728622616185

3) 57.627434627328064

4) 42.97325088983163

5) 36.85591294337311

6) 49.55089473417981

7) 31.651729884358577

and the Average of MAPE for the testing period (8th day to 14th day)

44.75182626996792