Impact of Environmental Factors

on Acute Myocardial Infarction

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Dataset & Data Preparation

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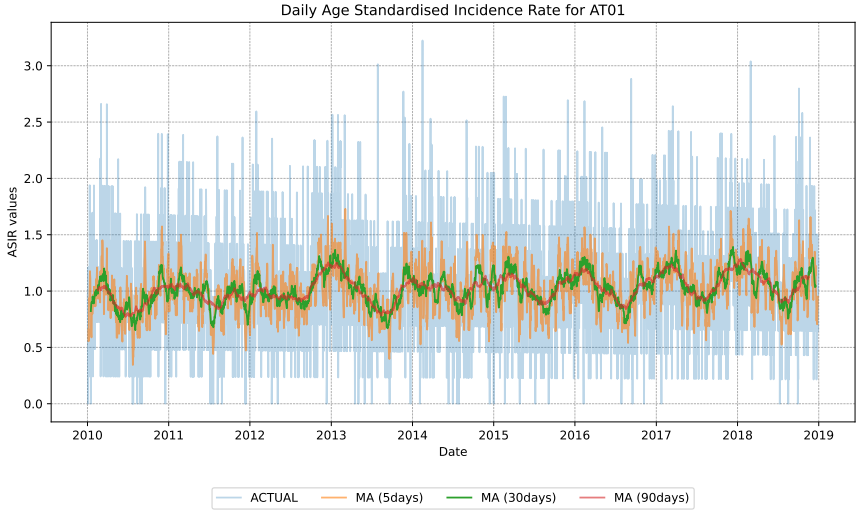
- **Response variable:** Age Standardised Incidence Rate (ASIR)
- A total of **5** predictors - Humidity, Temperature, Ozone levels, Particulate Matter, Public holidays

Target Variable - ASIR



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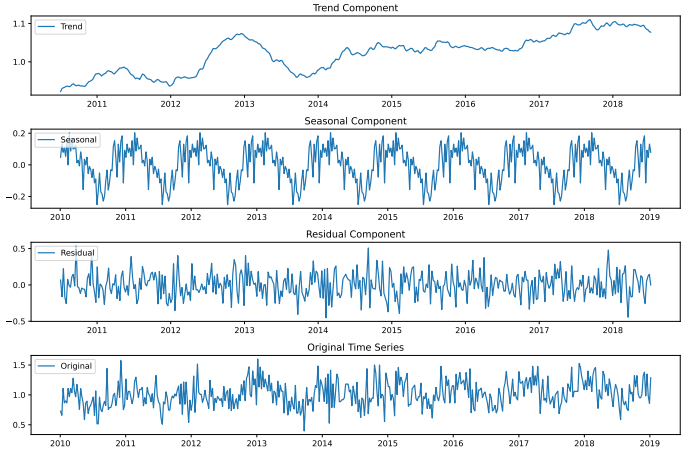

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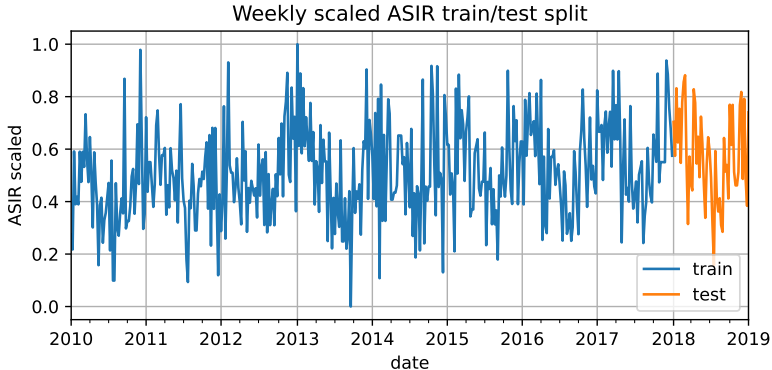

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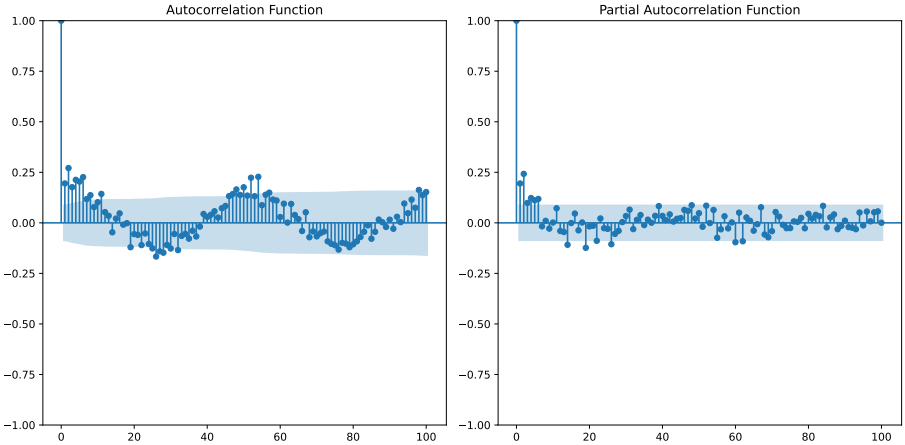

SARIMAX

- **S**: Seasonal component that captures periodic patterns at fixed intervals.
- **AR**: Autoregressive part that models the dependency between an observation and a number of lagged observations.
- **I**: Integrated part representing the differencing of raw observations to make the time series stationary.
- **MA**: Moving Average component that models the dependency between an observation and a residual error from a moving average model applied to lagged observations.
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By incorporating exogenous variables, SARIMAX can model the influence of external factors on ASIR.

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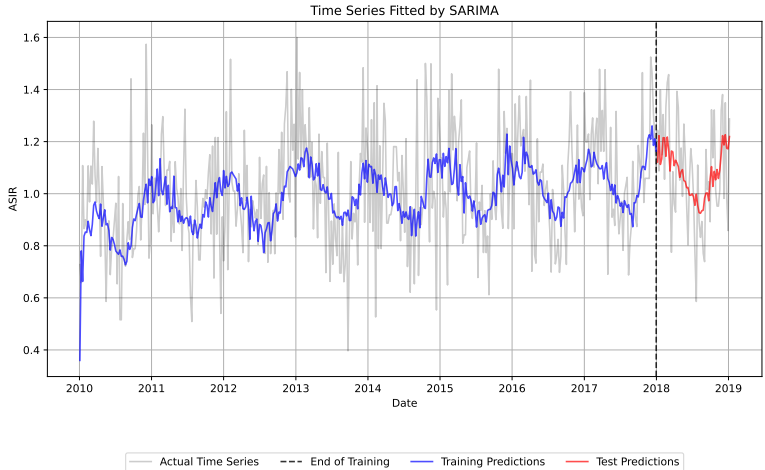
- can capture complex patterns and relationships to forecast future ASIR.

Results - SARIMAX



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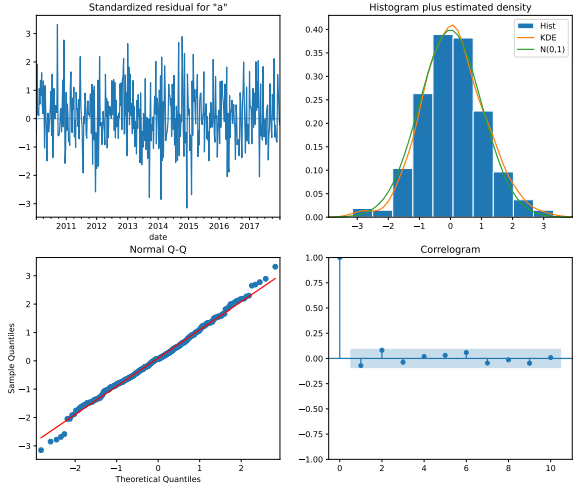
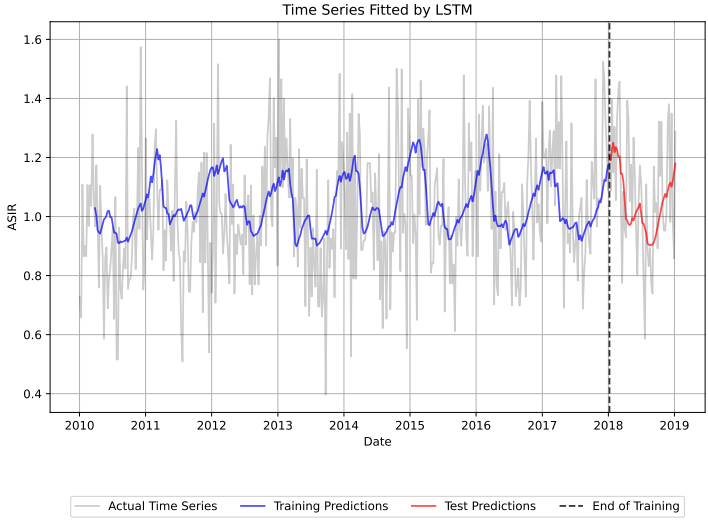
- Mean PM10 concentration (`mean_PM10`): An increase of 1 $\mu g/m^3$ in mean PM10 concentration is associated with an increase of approximately 0.146 units in ASIR of AMI.

Diagnostics - SARIMAX



Results - LSTM



Comparison

Table 1: Results

	SARIMAX	LSTM
MAE	**0.12**	0.15
MSE	**0.02**	0.03
RMSE	**0.15**	0.19
MAPE	26.60	14.53

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- SARIMAX outperforms LSTM in terms of both MAE and MSE, making it a more suitable choice for this forecasting task.
- However, the LSTM model exhibits substantially lower AIC and BIC values compared to SARIMAX, indicating a potentially better fit to the data and superior long-term forecasting capabilities

Thank you for your attention