Sales Forecasting for Automobile Manufacturer

Sales can be seen as a time series. The factors that are responsible to bring about changes in a time series, also called the components of time series, are as follows:

- 1. General Trend
- 2. Seasonal Movements
- 3. Cyclical Movements
- 4. Irregular Fluctuations

Trend:

The secular trend is the main component of a time series which results from long term effect of socio-economic and political factors. This trend may show the growth or decline in a time series over a long period. This is the type of tendency which continues to persist for a very long period. Prices, export and imports data, for example, reflect obviously increasing tendencies over time.

Seasonality:

These are short term movements occurring in a data due to seasonal factors. The short term is generally considered as a period in which changes occur in a time series with variations in weather or festivities. For example, it is commonly observed that the consumption of ice-cream during summer us generally high and hence sales of an ice-cream dealer would be higher in some months of the year while relatively lower during winter months. Employment, output, export etc. are subjected to change due to variation in weather. Similarly sales of garments, umbrella, greeting cards and fire-work are subjected to large variation during festivals like Valentine's Day, Eid, Christmas, New Year etc. These types of variation in a time series are isolated only when the series is provided biannually, quarterly or monthly.

Cyclic Movement:

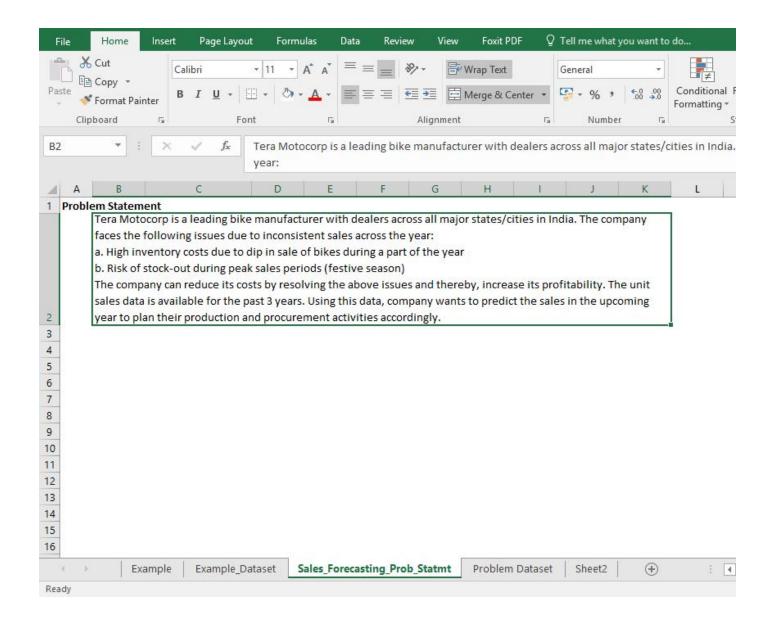
These are long term oscillation occurring in a time series. These oscillations are mostly observed in economics data and the periods of such oscillations are generally extended from five to twelve years or more. These oscillations are associated to the well-known business cycles. These cyclic movements can be studied provided a long series of measurements, free from irregular fluctuations is available.

Irregularity:

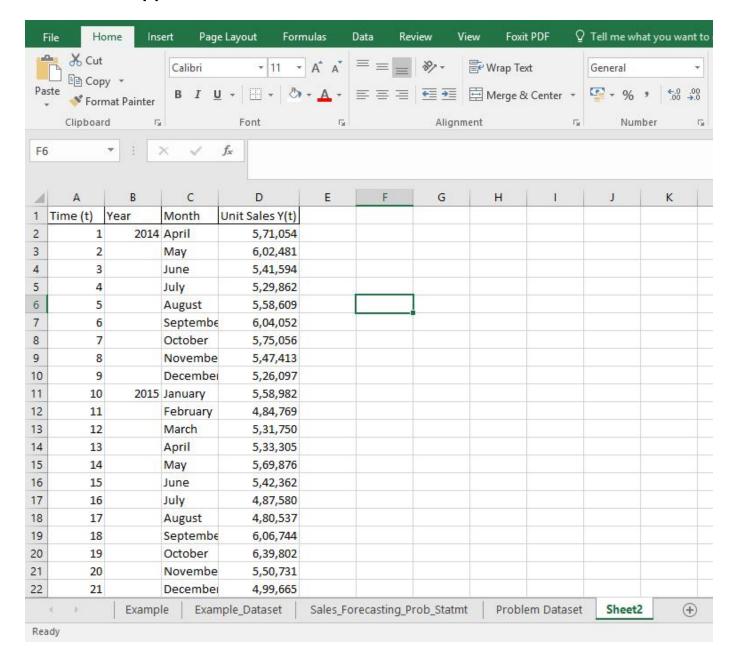
These are sudden changes occurring in a time series which are unlikely to be repeated, it is that component of a time series which cannot be explained by trend, seasonal or cyclic movements. It is because of this fact these variations some-times called residual or random component. These variations though accidental in nature, can cause a continual change in the trend, seasonal and cyclical oscillations during the forthcoming period. Floods, fires, earthquakes, revolutions, epidemics and strikes etc, are the root cause of such irregularities.

Therefore, sales Y(t) can be expressed in terms of Trend T(t), Seasonality S(t), Cyclic movement C(t) and Irregularity I(t).

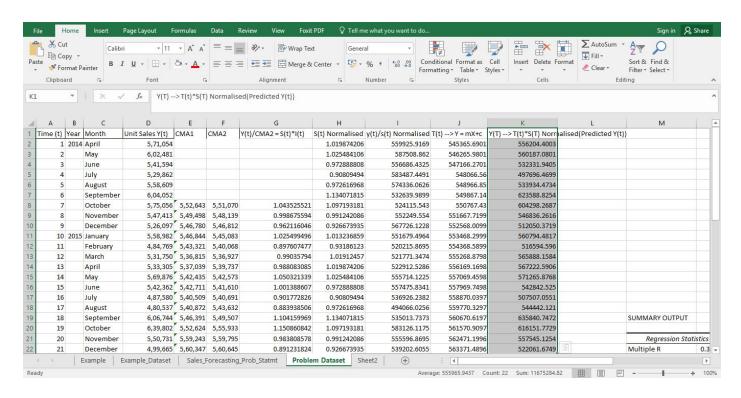
Y(t) = T(t)*S(t)*C(t)*I(t)



Given sales Y(t) for 2014-2018



Predicted Sales



Graph for actual sales vs predicted sales with predicted sales for the next year

