

1. Descriptive Techniques

Descriptive Techniques

Types of Variation

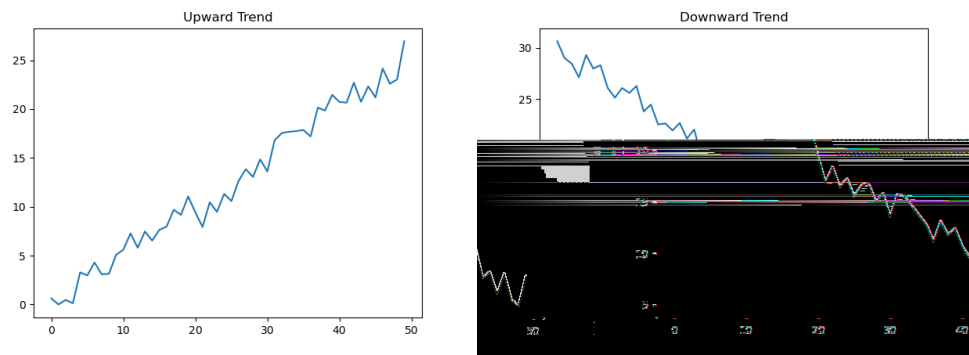
When the graph of a time series is plotted, we observe some haphazard changes in the graph over time. A part of this change, called the **systematic part** and can be accounted for while the remaining part is irregular. The systematic parts consist of :

- Secular Variation / Trend
- Seasonal Variation
- Cyclical Variation

Thus the value of the time series at time t , Y_t is the resultant of the combined effect of trend (T_t), seasonal variation (S_t), cyclical fluctuations (C_t) and irregular variations (I_t)

Trend

The smooth, regular, long-term movement of a series observed over a long period of time is called **trend**

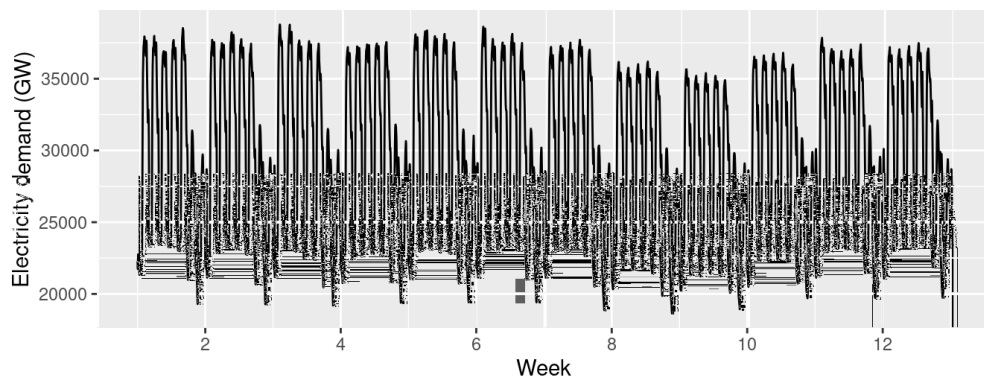


A series may change its course after some time but sudden or frequent changes are quite inconsistent with the idea of trend.

A series may show an upward or downward trend or may remain at more or less a constant level.

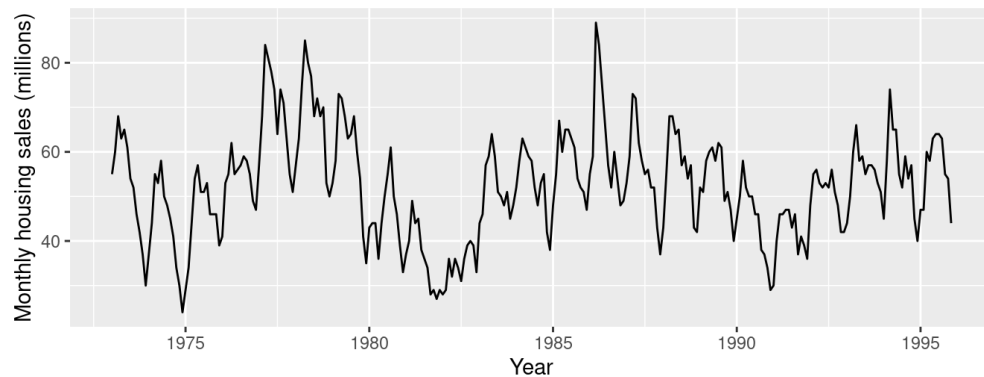
Seasonal Effect

Periodic movement (i.e. movement that repeats itself at regular time intervals) of a series where the period is not larger than a year is called **seasonal variation** or **seasonality** or **seasonal effect**. e.g. climatic changes, increase in sale of certain consumer goods during festivals.



Cyclic Changes

The kind of oscillatory movement in a time series with period of oscillation being more than a year is called **cyclic change** or **cyclic variation** or **cyclicity**. One complete period is called a **cycle**. These variations though more or less regular are not necessarily periodic.



Irregular Fluctuations

Model

Additive and Multiplicative