

1. Descriptive Techniques

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Types of Variation

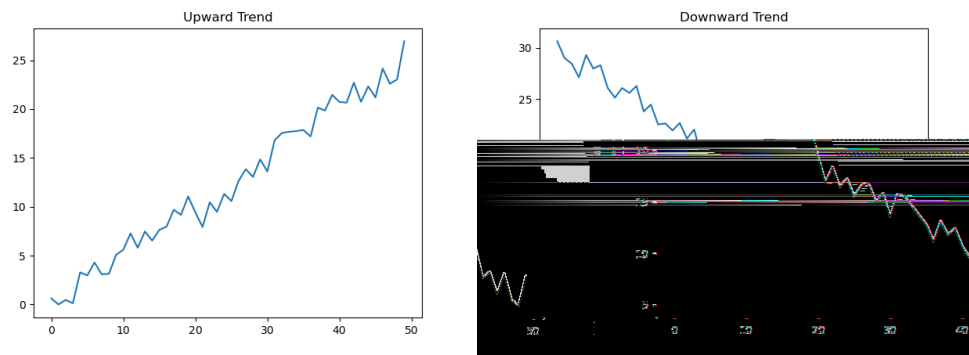
When the graph of a time series is plotted, we observe some haphazard changes in the graph over time. A part of this change, called the **systematic part** and can be accounted for while the remaining part is irregular. The systematic parts consist of :

- 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

Cyclic Changes

Irregular Fluctuations

Model

Additive and Multiplicative