

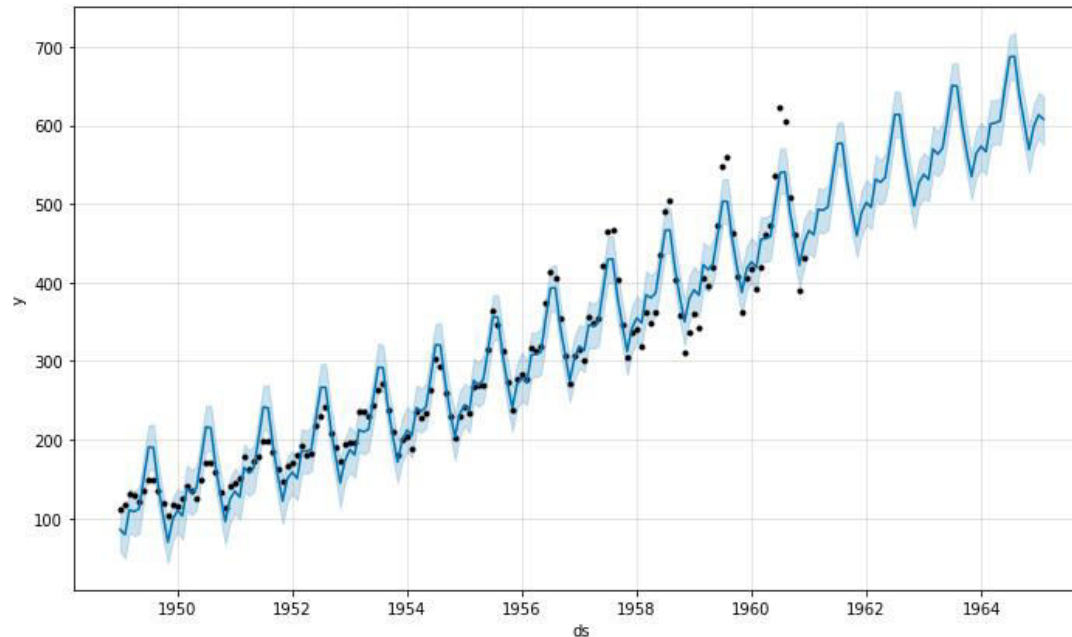


Start-Tech Academy

Seasonality & Trends

- Seasonality is a characteristic of a time series in which the data experiences regular and predictable changes that recur every calendar year.
- Any predictable fluctuation or pattern that recurs or repeats over a one-year period is said to be seasonal.

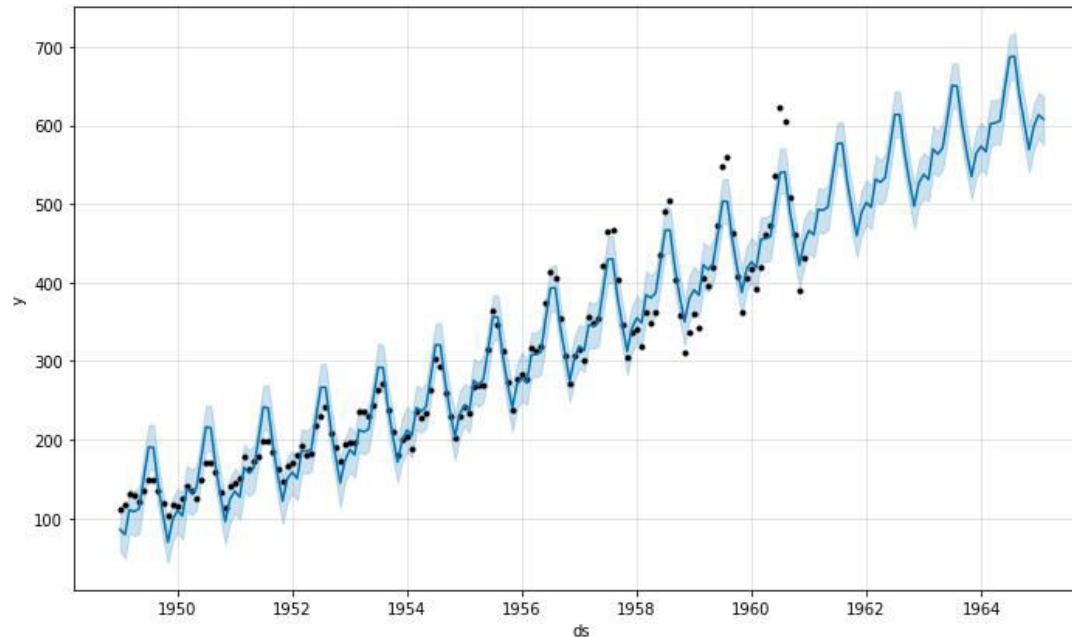
Seasonality



Seasonality & Trends

- A pattern of gradual change in a condition, output, or process, or an average or general tendency of a series of data points to move in a certain direction over time, represented by a line or curve on a graph

Trend



Seasonality & Trends

Problem Statement

- We have monthly airline miles travelled data Jan 2009 to April 2018
- We want to identify seasonality and trend effects
- We want to forecast future sales



Seasonality & Trends

You can often use seasonality and trend to predict sales

$$\text{Predicted Period } t \text{ Sales} = \text{Base} + \text{Trend} * \text{Period Number} + \text{Seasonal Index for Month } t$$

Additive Model

Base: The base is the best estimate of the level (without seasonality) of monthly airline miles at the beginning of the observed time period.

Trend: The trend is the best estimate of the monthly rate of increase in airline miles traveled.

Seasonal Index: Each month of the year has a seasonal index to reflect if travel during the month tends to be higher or lower than average.



Seasonality & Trends

You can often use seasonality and trend to predict sales

$$\text{Predicted Period } t \text{ Sales} = \text{Base} * (\text{Trend}^t) * (\text{Seasonal Index for Month } t)$$

Base: The base is the best estimate of the level (without seasonality) of monthly airline miles at the beginning of the observed time period.

Trend: The trend now represents the percentage monthly increase in the level of airline miles.

Seasonal Index: The seasonal index for a month now represents the percentage by which airline travel for the month is above or below an average month.

Multiplicative Model

