

Mean Absolute Percent Error Estimate:

$$\text{MAPE Estimate} = 100 \cdot \frac{|Actual_t - Forecast_t|}{|Actual_t| + 1} \cdot \frac{1}{n}$$

Linear Regression Model (assuming y is the forecast, x is the domain series, and n is the number of rows):

$$m = \frac{\sum_{i=1}^n (x_i \cdot y_i) - n \cdot \bar{x} \cdot \bar{y}}{\sum_{i=1}^n (x_i^2) - n \cdot \bar{x}^2}$$

$$b = \bar{y} - m\bar{x}$$

$$y = mx + b$$

Exponential Smoothing Non Trends:

$$Forecast_i(\alpha) = \begin{cases} Actual_i & \text{if } i = 1 \\ Forecast_{i-1} + \alpha \cdot (Actual_{i-1} - Forecast_{i-1}) & \text{otherwise} \end{cases}$$

s.t. $0 \leq \alpha \leq 1$

Exponential Smoothing With Trends:

$$Forecast_i = Smooth_i + Trend_i$$

where

$$Smooth_i(\alpha) = \begin{cases} Actual_i & \text{if } i = 1 \\ \alpha \cdot Actual_{i-1} + (1 - \alpha) \cdot (Smooth_{i-1} + Trend_{i-1}) & \text{otherwise} \end{cases}$$

$$Trend_i(\beta) = \begin{cases} 0 & \text{if } i = 1 \\ \beta \cdot (Smooth_i - Smooth_{i-1}) + (1 - \beta) \cdot Trend_{i-1} & \text{otherwise} \end{cases}$$

s.t. $0 \leq \alpha, \beta \leq 1$