Moving Average Model

Not Moving Average but shares some similarities

Specifies that the output variable depends linearly on the current and various past values of a stochastic term

Used for forecasting future values.

A special case and key component of ARMA and ARIMA modes of time series

Notation MA(q):

- $X_t = \mu + \varepsilon_t + \theta_1 \varepsilon_{t-1} + \cdots + \theta_q \varepsilon_{t-q}$
  - μ: mean of the series
  - $\theta_{1 \ldots q}$: parameters of the model
  - $\varepsilon_{t,t-1,\ldots,t-q}$: white noise error terms; moving average term
  - q: the order of the MA model.
- Model the error term as a linear combination of error terms occurring contemporaneously and at the various times in the past.
- White noise: any distribution of values is possible
  - Properties: i.i.d over time

Invertibility of MA models

- **Invertible**: if it is algebraically equivalent to a converging infinite order AR model
  - Constrain on θ: $|\theta| < 1$