Side Notes of Video Lecture

December 3, 2019

The variance of MA(q)

For an MA(q) process

$$y_t = e_t + \beta_1 e_{t-1} + \beta_2 e_{t-2} + \cdots + \beta_q e_{t-q},$$

the variance $\text{var}(y_t) = \sum_{l=1}^{q} (\beta_l^2 + 1)\, \sigma_e^2$, where "1" comes from the fact that the coefficient of e_t is normalized as 1. In the video the index is not aligned correctly.

Estimation of MA Model

The principle of estimating MA is maximum likelihood. What is presented in the video is a unconditional MLE with a hand-waving treatment of the initial value. There are alternative formulation of estimation, for example the conditional MLE. Details can be found in Sheppard's lecture notes. A rigorous development of the estimation method would involve too much calculation and is beyond the scope of the course. However, in reality the estimation is always handled by software automatically.