ETW3420
Principles of Forecasting and Applications

Topic 5 Pre-tutorial Activity Part 2

In this pre-tutorial activity, you will:

(i) Mathematically derive some ETS models.

(ii) Derive point forecasts from ETS models.

Question 1

Using the component form representation of TS(A,A),

(i) Derive the ETS(A,A,A) innovations state space model.

(ii) Derive the point forecasts for y_{T+1} and y_{T+2}.

Hint: Assume $e_t = \varepsilon_t = y_t - \hat{y}_{t|t-1}$, where $\hat{y}_{t|t-1}$ can be obtained from the forecast equation of the component form representation.

Question 2

Using the component form representation of TS(A,A),

(i) Derive the ETS(M,A,A) innovations state space model.

(ii) Derive the point forecasts for y_{T+1} and y_{T+2}.

Hint: Assume $\varepsilon_t = \frac{y_t - \hat{y}_{t|t-1}}{\hat{y}_{t|t-1}}$, where $\hat{y}_{t|t-1}$ can be obtained from the forecast equation of the component form representation.