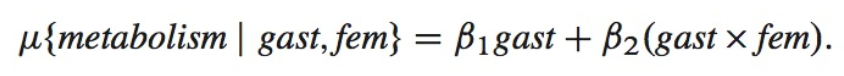
Problem 0

For the model below use the Delta Method



To Estimate



Check the estimation and approximate the standard error by the delta method.

(Note: inspect cases 31 and 32)

**Problem 1 Use Stock dataset (50 points)**

[a] Graph the data with a time series plot and describe the time series plot. (5 pts)

[b] What can we learn from the ACF and Test for White Noise? (5 pts)

[c] Provide a differencing analysis. (10 pts)

[d] Check the models Arima(0 , 1, 1)(0, 1, 1) and Arima(1, 1, 0)(0, 1, 1) check the fit of both models and compare AIC, L’Jung Box and Standard error. (10 pts)

[e] Write the model on d in terms of the backshift operator, and then without using the backshift operator. (10 pts)

[f] Forecast 10 periods. (10 pts)

**Problem 2 Use Sales dataset (50 points)**

Follow the four steps of arima modeling. Forecast 6 periods

Problem 3

The data are the daily scores achieved by a patient with mental problems on a test of perceptual speed. The patient began receiving a powerful tranquilizer on the sixty-first day and continued receiving the drug for the rest of the sample period. It is expected that this drug will reduce perceptual speed.

[a] Produce a time plot of the data showing where the intervention occurred. (5 pts)

[b] Fit an intervention model with a step function intervention to the series. Write down the model including the ARIMA model for the errors. (15 pts)

[c] What does the model say about the effect of the drug? (5 pts)

[d] Fit a new intervention model with a delayed response to the drug. (15 pts)

[e] Which model fits the data better? Are the forecast from the models very different? (5 pts each)

[f] Construct an ARIMA model ignoring the intervention and compare the forecast with those obtain from your preferred intervention model. How much does the intervention affect the forecast? (10 pts)