Stat 142 (Time Series Analysis)

Laboratory Exercise No. 4

INSTRUCTIONS: Answer the following as indicated. Prepare your answer sheet in R Markdown and submit in PDF format.

Load the *qgas* data from the **fpp2** package and do the following. This data consists of the total quarterly production of Portland cement in Australia (in millions of tons) from 1956:Q1 to 2014:Q1.

1. Do the data need transforming? If so, find a suitable transformation.
2. Is the data stationary? If not, find an appropriate differencing which makes the data stationary.
3. Identify a couple of ARIMA models that might be useful in describing the time series. Which of your models is the best according to their AIC values?
4. Estimate the parameters of your best model and do diagnostic testing on the residuals. Do the residuals resemble white noise? If not, try to find another ARIMA model which fits better.
5. Forecast the next 4 quarters of data using your preferred model.
6. Write the final ARIMA model equation in terms of the backshift operator.