STA 477 Concept Problems 2

1. Describe how the Yule-Walker equations can be used to obtain the autocorrelation function for a stationary $AR(p)$ process.

2. Given a realization $\{x_t\}$, $t = 1, ..., N$, of an $AR(1)$ process, explain how you would predict X_{N+1}.

3. Under what conditions is an $ARMA(p, q)$ process both stationary and invertible? Explain how one finds the equivalent $MA(\infty)$ and $AR(\infty)$ processes.

4. Explain how to find the autocorrelation function, $\rho(\tau)$, of an $ARMA(p, q)$ process.

5. Under what conditions is an $ARIMA(p, d, q)$ process stationary?

6. How does one determine whether or not a process $\{X_t\}$ is stationary? If it is determined that $\{X_t\}$ is not stationary, discuss options to transform $\{X_t\}$ so that the resulting process is stationary.

7. Explain how confidence intervals may be used to help select an appropriate model for a time series realization.