STA 477 Concept Problems 1

1. What is the difference between a stochastic process and a time series realization?

2. Why is it useful to build up a large dictionary of models prior to fitting models to data?

3. Let $\widehat{X}_{t+1}$, which is a function of $X_1, ..., X_t$, be a predictor of X_{t+1}. Under what conditions is $\widehat{X}_{t+1}$ equal to X_{t+1}?

4. For a time series having both trend and seasonal components, does it matter whether or not the trend or seasonal component is addressed first? Please explain.

5. Is the sample correlation between X_t and X_{t+1}, for $t = 1, ..., N$, the same as $r_1 = \widehat{\rho}(1)$? Please explain.

6. Explain the difference between weakly and strictly stationary processes.

7. Under what conditions is a $MA(q)$ process equivalent to a $AR(\infty)$ process?