DSA 5203: Time Series Analysis – Spring2019
FINAL EXAM
Released on April 25th ,2019 - Due on May 9th,2019

1. [30pts] Consider the AR models,
   - $x_t = 0.5 + 0.1x_{t-1} + \varepsilon_t$
   - $x_t = 0.5 + 0.1x_{t-4} + \varepsilon_t$
   - $x_t = 0.5 + 0.1x_{t-1} + 0.1x_{t-4} + \varepsilon_t$

   Repeat the following 3 steps to above AR models.

   a. Compute the theoretical ACF and plot it
   b. Generate x_t for $1 \leq t \leq 1000$ and plot x_t
   c. Compute the empirical ACF using the samples and compare it with your answer from (a)
2. [60pts] Download 3 distinct time series containing trend and seasonality from http://www.statsci.org/datasets.html
   a. Plot each series and compute its ACF and PACF
   b. Based on the ACF and PACF, pick 2 distinct models and estimate their parameters
   c. Compare the residual for each model
   d. Which model is better and why?
   e. Repeat this for each of the 3 time series you have selected

Note: Remember to submit any code and to document it.