

DSA 5203: Time Series Analysis – Spring2019
Homework - 2 : Due on 01/31/2019

- 1) Generate one set of 100 samples of $x_t \sim iid N(0,1)$, and compute its mean \bar{x} , and variance $\hat{\sigma}^2$
 - a) Repeat this experiment 100 times and obtain 100 estimates of \bar{x}_i and $\hat{\sigma}_i^2$
 - b) Compute the mean, variance of \bar{x}_i for $1 \leq i \leq 100$
 - c) Compute the mean, variance of $\hat{\sigma}_i^2$ for $1 \leq i \leq 100$
- 2) Generate $\Sigma_t \sim iid N(0,1)$ for $1 \leq t \leq 500$
 - a) Define $x_t = \varepsilon_t + 0.5\varepsilon_{t-1}$ called MA (1) process
 - b) Plot x_t (vs) x_{t-1} , x_t (vs) x_{t-2} , x_t (vs) t
 - c) Compute the mean, variance and autocorrelation of x_t and plot
- 3) Plot $N(0, \sigma^2)$ for $\sigma^2 = 0.1, 0.5, 1.0, 2.0, 5.0$ on the same plot and comment on what you observe.

NOTE: Read through the Modules 2.1 – 2.4 and identify all the basic concepts