

AGEC 643
Homework 1
Due September 24, 2012

Use the data in HWK 1 2012.XLSX. The Worksheet names correspond to the questions below. FOR ALL QUESTIONS WHERE PROGRAMMING IS INVOLVED DOCUMENT THE CELLS YOU PROGRAM WITH =VFORMULA().

1. Use the data in Part 1 to run a regression two ways.
 - a. Use the matrix functions in Simetar to estimate the betas for the regression
 - b. Use the Multiple Regression tab in Simetar to estimate the betas

2. Using Excel write a program to simulate 500 congruential random uniform standard deviates. Use the parameters below.
 - a. Parameters $a=23$, $b=0$, $L=32767$, $S=23$
 - b. Report the summary statistics for the 500 USDs and the first 65 USDs
 - c. Check for runs. What is the problem with this method of generating USDs?

3. Test two random number generators for alternative number of iterations. Test =RAND() and =UNIFORM() for iteration counts of: 25, 50, 100, 150, 200, 250, 300, 350, 400, 500, 600, 800, 1000, 2000, 4000, and 10000
 - a. Develop a table of summary statistics for average, standard deviation, min and max for all of these iteration counts.
 - b. Develop a chart of the means for the different number of iterations
 - c. Develop a chart of the standard deviations for the different number of iterations
 - d. Print the table and the charts, ONLY.
 - e. How many iterations are necessary to get stable and reliable statistics for mean and standard deviation?

4. The data in Part 4 is the record of base hits for a big league baseball player, and the number of times he scored after 200 at bats.
 - a. Use the data to calculate parameters for the conditional distribution to simulate the probability distribution for the number of runs this player will score after 300 at bats.
 - b. Simulate the conditional distribution for the number of times the player will score in 300 at bats and report the statistics.
 - c. Develop a CDF for the number of runs.

5. Use the data in Part 5 to estimate the parameters for an empirical probability distribution.
 - a. Test the data for a trend and de-trend if necessary.

- b. Estimate the EMP parameters for fractional deviates from forecasted X showing every step like I did in class. DO NOT include the pseudo min and max.
 - c. Estimate the EMP parameters using the appropriate option in the Simetar icon for EMP.
 - d. Simulate the two distributions using the trend forecasted X in year 30.
 - e. Report the parameter calculations and the summary statistics for the two simulated distributions. DO NOT print the simulated values.
6. Use the data in Part 6 to estimate the parameters and test alternative parametric distributions for the random variable X. Replace one of the distributions which did not get estimated by UPES with the EMP and be sure to use the common USD to simulate the EMP.
 - a. Report the parameters estimated by Simetar.
 - b. Prepare a table with the summary statistics for the simulated distributions and the CDFDEV criteria values.
 - c. What is the best fitting distribution?
7. Use the data in Part 7 to estimate a multivariate normal distribution of crop prices.
 - a. Calculate the parameters, ignoring trend and structural dependencies, to simulate the MVNORM three ways,
 - i. One Step
 - ii. Two Step
 - iii. Three Step
 - b. Simulate the three distributions and report the summary statistics for the three distributions.
 - c. Validate the three distributions against the historical data using the multivariate tests for testing the means, covariance, and correlations.
 - d. Print the parameter estimation steps, the simulation summary statistics and the validation results.

If you have problems see me. I will be in the office the 18th-21st.