IEG 323 System Simulation
Fall 2024
Homework number two (group submission)
Due Monday, September 30th, 2024
Please include all details possible for your solutions, then Submit your solution in a Pdf and word files format by e-mailing it to my e-mail not later than 2:30 a. m. on the due date

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1. Suppose that 7.3, 6.1, 3.8, 8.4, 6.9, 7.1, 5.3, 8.2, 4.9, and 5.8 are 10 observations from a distribution (not highly skewed) with unknown mean μ. Compute $X(10), S^2(10)$, and an approximate 95 percent confidence interval for μ.
2. For the 7.3, 6.1, 3.8, 8.4, 6.9, 7.1, 5.3, 8.2, 4.9, and 5.8 are 10 observations from a distribution (not highly skewed) with unknown mean μ, test the null hypothesis H_0: $\mu = 6$ at level $\alpha = 0.05$.
3. A manufacturing process is supposed to produce ball bearings with a diameter of 0.5 inch. The company examines n= 50 ball bearings and finds that X(50) = 0.45 and $S^2(n) = 0.06$. Test the null hypothesis H_0: $\mu = 0.5$ against the alternative hypothesis H_1: $\mu \neq 0.5$ at level $\alpha = 0.05$. Also, construct a 95 percent confidence interval for μ.
4. What is difference between covariance and correlation?
5. What Does a correlation of 0 Mean?
6. What is the danger in not using the right probability distribution? Support you answer with an example.
7. Define the following:
    a. Location parameter (γ).
    b. Scale parameter (β).
    c. Shape parameter (α).
8. What are the procedures (activities) that are needed to select an input probability distribution and describe each of them excessively?
9. Why do we test data collected for independence?