

Homework Assignment #4

due 4:30 pm, Wednesday, November 11

***** Due time will be strictly enforced. Late HW is subject to at least 25% penalty *****

***** There is a 20% penalty for the HW turned in through email *****

1. Suppose we conduct 10 independent simulation runs to estimate the mean throughput of a network system. The observed throughputs from these 10 simulation runs are 7.3, 6.1, 3.8, 8.4, 6.9, 7.1, 5.3, 8.2, 4.9 and 5.8. Suppose we want to estimate the mean throughput.
 - (a) (5 points) What is the 95% confidence interval if we use the Normal distribution model?
 - (b) (5 points) What is the 95% confidence interval if we use the t-distribution model?
 - (c) (5 points) What is the 99% confidence interval if we use the t-distribution model?

2. Continue Question 2. Again, the observed throughputs from these 10 simulation runs are 7.3, 6.1, 3.8, 8.4, 6.9, 7.1, 5.3, 8.2, 4.9 and 5.8. But we want to estimate the probability that the throughput is higher than 8.
 - (a) (5 points) What is the 80% confidence interval if we use the Normal distribution model?
 - (b) (5 points) What is the 80% confidence interval if we use the t-distribution model?

3. (15 points) Run the following three Arena examples located at /Arena/Arena Book/:

- (a) Mod_04_1.doe (the example presented in section 4.1 of the Arena book)
- (b) Mod_04_2.doe (the example presented in section 4.2 of the Arena book)
- (c) Mod_04_3.doe (the example presented in section 4.3 of the Arena book)

You have to turn in a printout of the "Category by Replication" report for each example. If the report is longer than 1 page, turn in only the first page.

Notes:

1. *While it is not required, it is highly recommended that you follow the instructions given in sections 4.1~4.3 to build the Arena models by yourself. Then you can verify your simulation results by running the provided files.*
2. *To access the example files, you have to enter "student" as your serial number when you installed Arena. Please see Appendix E in the Arena book for detailed instructions.*