

# FUNDAMENTALS OF ENGINEERING STATISTICAL ANALYSIS

ISE/DSA 5013

## Assignment 9

Show your work for calculation problems. You will receive no credit if you only provide the answer. *As with all homework this semester, spend time to be neat and organized. Any disorganized submissions are subject to a zero grade.*

### Problem 1

The 15 observations in the Assignment 9 spreadsheet represent a sample of the repair times, in hours, of a complex piece of machinery.

- a. Find the maximum likelihood estimates of the two parameters assuming that these data are normally distributed.
- b. Using the parameters in part a, use the basic Pearson goodness-of-fit test to determine if a normal distribution is indeed a good fit assuming 95% confidence.
- c. What's the probability that repair time of this piece of machinery exceeds 75 hours?

### Problem 2

Thirty units were placed on test until 20 failures were observed. The failure times in the Assignment 9 spreadsheet were obtained in accelerated test hours.

- a. Find the maximum likelihood estimates of the rate parameter assuming that these data are exponentially distributed.
- b. Using the parameter in part a, use the basic Pearson goodness-of-fit test to determine if an exponential distribution is indeed a good fit assuming 95% confidence.
- c. What's the probability that failure in this unit will occur before 65 hours?