**Lab 3 : Introduction to Confidence interval analysis**

**Confidence interval (C.I.) for Population mean**:

* Test of normality
* Influential versus outlier data
* Test of outlier
* Manual computation
* Interpretation of results
* Minitab applications
* Non-parametric model

We would like to obtain a 90% confidence interval for the mean of the data population associated with a critical manufacturing process measurement. (What about a 95% C.I.? Length versus practical usage?) Due to the destructive testing nature of this measurement, the following small set of random observations has been obtained.

**10.5, 12.9, 15.0, 9.3, 21.0, 11.9, 34.0, 12.2, and 18.3**

A. Check for the normality of the data population and then manually determine the required C.I. (assume the observation valued 34.0 is an influential data point and you may not cross it out). **Verify your results using Minitab. Make an interpretation of your**

C.Check to see if the observation 34.0 is indeed an outlier. If yes, then discard this data point and using Minitab compute a new C.I.

B. If the normality test in Part A fails and yet you may not wish to discard the observation 34.0, then compute an equivalent non-parametric C.I. for the central tendency of the data population **(use Minitab).** Make an interpretation of your obtained C.I.

D. What C.I. model would you use if the sample size was much larger than the present n= 9 (say, by a factor of 5X to 10X), using manual computations? What about using the Minitab software?

**No Lab report required.**

**Sample data for Grubb’s outlier test**

Data 1 Data2 Data3 Data4 Data5

2 2 2 2 2

4 4 4 4 4

9 9 9 9 9

4 4 4 4 4

8 8 8 8 8

12 12 12 12 12

15 15 15 15 15

9 9 9 9 9

10 10 10 10 10

22 22 22 22 22

340 340 340 340

400 400 400

1000 1000

-10000