STAT 3611   Lab 1   Spring 2015   Maghsoodloo

1. Open a folder in your Drive H or on Canvas, named STAT 3611. For this lab, your Excel file will be called Lab1, downloading my Excel data-file (on Tensile Ultimate Strength → Save As Lab 1 in your STAT 3611 folder. Now open the above Excel data and keep the data in column B4-B156 of your Excel file, headed by X (= TUS measured in psi). Put the observation numbers in column A (starting with 1 at A4 thru A156). Then, obtain the order statistics in C4-C156, with column heading $x_{(i)}$.

2. Give the value of n, the order-statistic $x_{(7)}$, and use Excel formulas in order to compute the indicated sample statistics: R, $\bar{x}$, S, the 1at quartile Q1, Q2 = Median, Q3, IQR, and cv_X in F5-F14. Then write the acronym LOC (Location) or VAR (Variability) in column G wherever is appropriate. Trim 5% of the data to compute the exact $\bar{x}_{Tr(5)}$.

3. Compute the indicated values of sum, CF, USS, CSS, S^2, S, $se(\bar{x})$, cv_{Xbar} $\hat{\alpha}_3$ = skew (this last measures asymmetry), and $\hat{\alpha}_4$ = kurt (this last measures kurtosis) in k5-k14, and in column L indicate whether each statistic is a measure of location or variability.

4. In the xlsx sheet tab (called Histogram) compute the Sturges guideline $C_1 = 1 + 3.3 \times \log_{10}(n)$; further compute $C_2 \cong \sqrt{n}$, and Shapiro's recommendation $C_3 = 4 \times [0.75(n-1)^2]^{0.20}$. This last guideline is generally too large unless the size of sample exceeds 500. Now average C_1 & C_2 and round down to obtain the number of subgroups (or classes) C = 10. Then compute the subgroup length Δ, always rounding up to exactly the same no. of decimal as that of the data. Draw the histogram using MS Excel. In the Bin column write the upper limit of the 1st subgroup, which will be 124.7 (the class-limits will be 122.0-124.5, 124.6-127.1,…, 142.8-145.3, 145.4-147.9) ending with the upper class limit of the subgroup before the last (145.3), i.e., Δ = 2.6. Next go to Data, Data Analysis, Histogram, and ok. For input range, input the X column. For Bin range, insert your Bin column, and make sure to check the chart output before you ok. What inferences can you draw from your histogram.

5. Now open Minitab and copy & paste your TUS data onto C1. Go to Stat → Basic Statistics → Display Descriptive Statistics, and in the dialogue box make sure to use Statistics… to click on the ones that were computed in parts 2 & 3 above. Compare your answers with those of Excel. Then go to Minitab's Graph → Histogram, and double-click on the histogram to use binning and midpoints to convert the Minitab's histogram to the one you obtained using MS Excel. Finally, go to Stat → Basic Statistics → Graphical Summary to examine the AD-statistic that shows the TUS data is not normally distributed.

If you are in the 12:00 section, please upload your solutions on Canvas by 2:30 PM; otherwise, please upload your output by 5:00 PM. Thanks for cooperation.