Excel Practical 3: t-tests and ANOVA

Tasks:

1. Go to Data Set 1. Unfortunately, Excel doesn't have any functions or add-ins which run 1-sample t-tests so we'll have to create this by hand. Follow the steps in slides 15 to 21 and check you can re-create all the numbers and understand what is happening.
2. In fact, you can fool Excel into performing a 1-sample t-test by doing the following
    a. Create a column of 0s next to your data set 1
    b. Go to Tools > Data Analysis > t-test: paired two sample for means
    c. Pick the data as your variable 1 range. Pick the zeros as your variable 2 range
    d. Choose 120 as your hypothesized mean difference and click ok
    e. The numbers in the table should match your results from 1
3. Re-read the slow learners example in Class 4 slides 30 to 31.
    a. See if you can apply the method to compare two of the columns in the Clenbuterol data (you can choose whether to compare two runs, or two different fortification levels). Try and do all the computations by hand. (If you're unconfortable with this try to skip to part b)
    b. When you're happy with your results, choose Tools > Data Analysis > t-test: two sample using unequal variances, enter your two columns and use 0 as the hypothesized mean difference. Check you get the same results as your computation from part a.
4. On data set 3, choose Tools > Data Analysis > ANOVA: single factor. Pick two of the columns (corresponding to different fortification levels). Click OK and have a close look at the ANOVA table output. See if you can understand what it is saying and draw conclusions. You might like to create the LSD values to compare the means

5. (Harder) Again with data set 3, choose Tools > Data Analysis > ANOVA: Two Factor with Replication. Highlight all the numbers including the column and row labels, and click OK. See if you can interpret all the output. Is there evidence of an interaction? Which effect seems to be most statistically significant – the fortification or the run?