**Statistics # 5 – Estimating Population Parameters**

In the world of kinesiology it is often desirable to know the mean of a population on some variable. For example, Health Canada my want to track obesity trends for the next 20 years. This would require knowing the mean of the Canadian population on some obesity indicator such as BMI. Since it is not possible to measure every Canadian, researchers use a technique known as [statistical inference](http://en.wikipedia.org/wiki/Statistical_inference) to estimate the mean of a population based on a smaller, yet hopefully representative, [sample](http://en.wikipedia.org/wiki/Sample_%28statistics%29). Statistical inference allows a researcher to determine how accurate the mean of the sample is and what the odds are that it is different from the population mean by a given amount. This method is based around a statistic called the [standard error of the mean](http://www.graphpad.com/help/prism5/prism5help.html?stat_standard_deviation_and_standar.htm) and the fact that the means of repeated samples from a population would be [normally distributed](http://en.wikipedia.org/wiki/Normally_distributed). For example, the [anthropometric](http://en.wikipedia.org/wiki/Anthropometric) data from this class could represent a sample from a much larger population such as “all university students in Canada”.

1. Download Statistics # 5 – Estimating Population Parameters from my webpage and save the file as “Last Name First Name Statistics #5” e.g. “MacKenzie Sasho Statistics #5”. Remember to change the file name when saving to your computer.
2. Answer the questions below and **place your responses in the appropriate location within the “Questions and Answers” worksheet**. You may create as many additional worksheets as you like, and manipulate the raw data however you want. I will need to review these sheets to ensure you just didn’t copy the answers from another student. If I cannot determine how you arrived at your answers by reviewing your worksheets, then you will not receive credit for your answers.
3. NORM.S.INV, and NORM.S.DIST will be helpful functions
4. **Questions**
5. What is the sample standard deviation for class age?
6. Based on our class data, what would be your best guess at the amount of error in estimating the age of all third year university students in Canada?
7. Based on our class data, what would be your best guess at the mean age of all third year university students in Canada?
8. Based on the class data, you could conclude, with 95% confidence, that the interval from \_\_\_\_\_ to \_\_\_\_\_days contains the mean age of the population of all third year university students.
9. What is the standard error of the mean for the class wingspan data?
10. At what level of confidence would you state that the interval bounded by ±1 cm of the class mean contains the mean wingspan of all third year university students in Canada?
11. What is the chance that the mean height of all third year university students in Canada is greater than 177 cm? (Answer should be to 3 decimals)
12. What is the chance that the mean height of all third year university students in Canada is less than 173 cm? (Answer should be to 3 decimals)
13. At what level of confidence would you state that the interval from 173 to 177 cm contains the mean height of all third year university students? (answer with a percentage to 1 decimal)
14. Email your Excel file to the class gmail account. Type “Statistics #5” as your **Subject** and nothing else, not your name, nothing. In fact, copy and past **Statistics #5** from here into your email.