# Guided Workshop 3: Real-Time Power Calculator

***Instructions:*** Download the file “Guided Workshop 3 – STARTER.xlsx”. I would recommend setting aside about an hour for this activity. When you are ready to start the workshop, open and begin the video “Guided Workshop 3: Real-Time Power Calculator”.

The video will have optional in-video questions to help teach you and guide you along. You won’t submit this document, but it will be a good template/guide for the activity.

At the end, after you have completed the Excel file above, you will open the “Guided Workshop 3 Submission” quiz, where you will enter the answers to the questions at the end of this document.

***Background/Objective***

You manufacture stainless steel bolts, and it is important that you are able to detect if and when a sample average exceeds a specified shift in mean from the target length of 20 mm. From a long manufacturing history, the population variance of bolt length is 1.2 mm2.

In this workshop, you’ll be creating an Excel simulation that will calculate the power of the test as a function of sample size and shift in mean. The mean shift and sample size are chosen by the user using spin buttons on the worksheet. This workshop will reinforce your understanding of Type II error () and power of the test.

When you are done putting together your Excel file, answer the following questions in the “Guided Workshop 3 Submission Quiz” on Coursera (the text fields below are only for your benefit – you won’t be submitting this document).

1. What is f(x) for H1 when x = 20, n = 8, and the mean shift is 1.0 mm? Click here to enter text.
2. If the mean shift = 0.8 mm, what is **xbar\_crit** when n = 8? Click here to enter text.
3. When the mean shift = 0.8 mm and n = 8, what is power? Click here to enter text.
4. If samples of size 12 are taken, how probable is it (i.e., what is power) that you will be able to detect a shift in mean of 0.5 mm? Click here to enter text.
5. If you need to be able to detect a shift in mean of 0.9 mm with a power of at least 90%, how many samples do you need to take every sampling period? Click here to enter text.

**That’s all! 😊**