MECE-301 Engineering Applications Laboratory
## Assignment #5

In statistical analyses, the probability distribution of a perfectly random, continuous variable x is given by the *Gaussian Probability Density Function f(x)*:

$$f(x) = (2\pi\sigma^2)^{-\frac{1}{2}} \cdot e^{-(x-m)^2/2\sigma^2}$$

Where m is the *mean* of the distribution, σ is the *standard deviation*, and the lower case "*e*" refers to the exponential function. Create a graph in LabVIEW with four plots, where each plot depicts one of the following cases of values for m and σ, for x between $m - 3\sigma$ and $m + 3\sigma$ in 500 equal divisions (i.e., for 501 values of x between the limits specified):

	Mean	Std. Dev.
Plot 0	10.0	2.43
Plot 1	-1.0	3.85
Plot 2	3.0	2.5
Plot 3	6.0	2.0
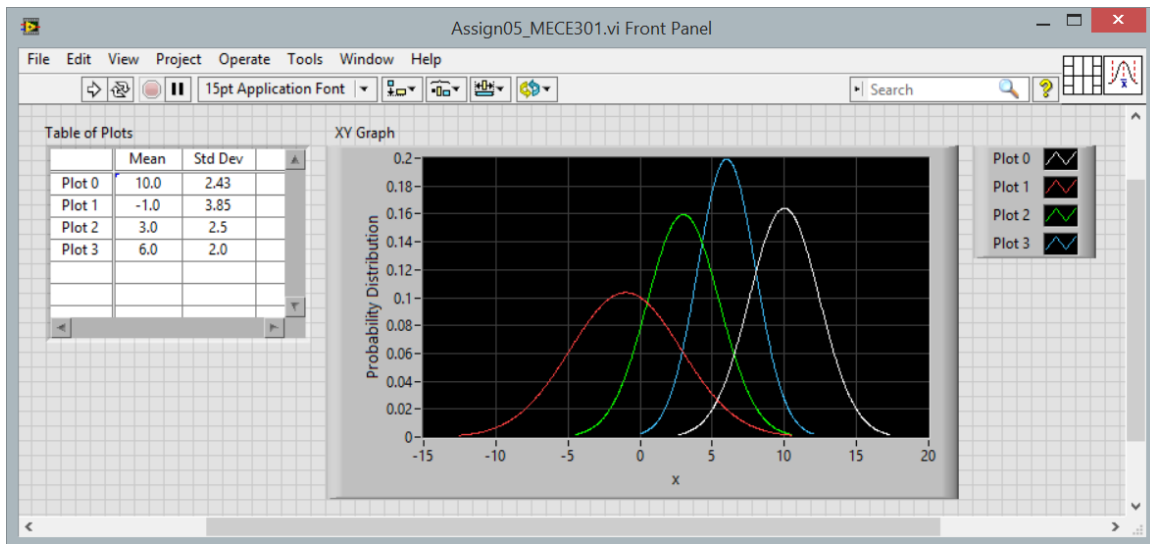
On the front panel, use a *Table* control to enter the values for the different plots. Some things to note:

- The table control is actually just an array of strings. As shown in the figure, the table has the row and column headers enabled (right-click on the control and select the options). Therefore, the numbers that represent the mean values are actually in column zero on the array, and those for the standard deviation are in column one.

- Since the elements are strings, you will need to convert them to numbers before you can use the values for the rest of your work (use the *Fract/Exp String to Number* function).

- Although this particular assignment shows only four cases of plots to draw, you can easily make your program automatically adapt to the number of rows with values in the table. Remember that if you wire an array to a for loop, the loop will automatically run enough times to process all of the rows in the array (no wiring to the loop count is required), and each iteration of the loop will automatically pull out the next row in the array.

- You will need to use an *X-Y Graph* for this assignment, which in turn will require a *Bundle* function to cluster the arrays of x and y values for each plot. These in turn are automatically built into a 1-D array by the loop, if configured properly.