ME 3901 - Midterm Examination Practical Portion (50% of midterm)

THIS PORTION OF THE MIDTERM IS COMPLETELY CLOSED BOOKS, NOTES, AND ELECTRONIC COPIES OF ANYTHING.

This exam was performed by:

Name:_____

Determine the current limit of your USB 6229 DAQ module. This will be accomplished by requesting an output voltage and reading that voltage across one of the 120 ohm strain gages. The output voltage requested will be increased incrementally while monitoring the actual voltage provided across the strain gage. At some point the voltage requested cannot be provided. (You have all done this already in your labs. I've stated multiple times during the last lab that you can request a 10V excitation, but you will not get it. It simply exceeds the amperage ability of the unit. That is why we have always measured the source voltage in both labs.) This small experiment simply shows where the requested voltage (x axis) vs. delivered voltage (y axis) loses its linearity or asymptotes to a maximum voltage output ability.

Remember: No use of the network, except to email the returned exams to sullivan@wpi.edu

This task can have several components which will be considered for partial credit towards the final VI. The VI must be able to read elapsed time. Use a "while loop". Within the while loop have "analog output" and "analog input" capabilities. Use controls for the physical channel selections. Set the max/min limits of both the analog input and analog output to be +/- 5V. Create two indicators, one for Voltage Requested and another for Voltage Delivered. Write elapsed time, V Requested, and V Delivered to a spreadsheet file. Use an increment of 0.05 Volts within the while loop (either a constant or a control). Begin the while loop with V requested = 0.0V, then for each loop, increase the requested voltage by the increment value (0.05V) until the final requested voltage is 2 Volts. (A shift register works well.) Have the loop stop once the final voltage is reached (hitting the stop button is fine). If you don't automatically stop the vi, use a time delay of .5s (minimum) so you can see the requested voltage change and have time to hit the stop switch. (With a time delay of .5s, it will take 20 seconds to complete the experiment.)

Extra credit: Plot the Actual V (y axis) vs. Requested V (x axis) within your excel file.

Save the VI as your 'email.vi' and the spreadsheet output file as 'email.xls'. Zip both of these files into a email.zip (where 'email' is YOUR email address before the @wpi.edu). Email the zip file to me (sullivan@wpi.edu). Be sure you've completed the upload before signing off the computer. Check with the TA if you have difficulties.