January 21, 2024

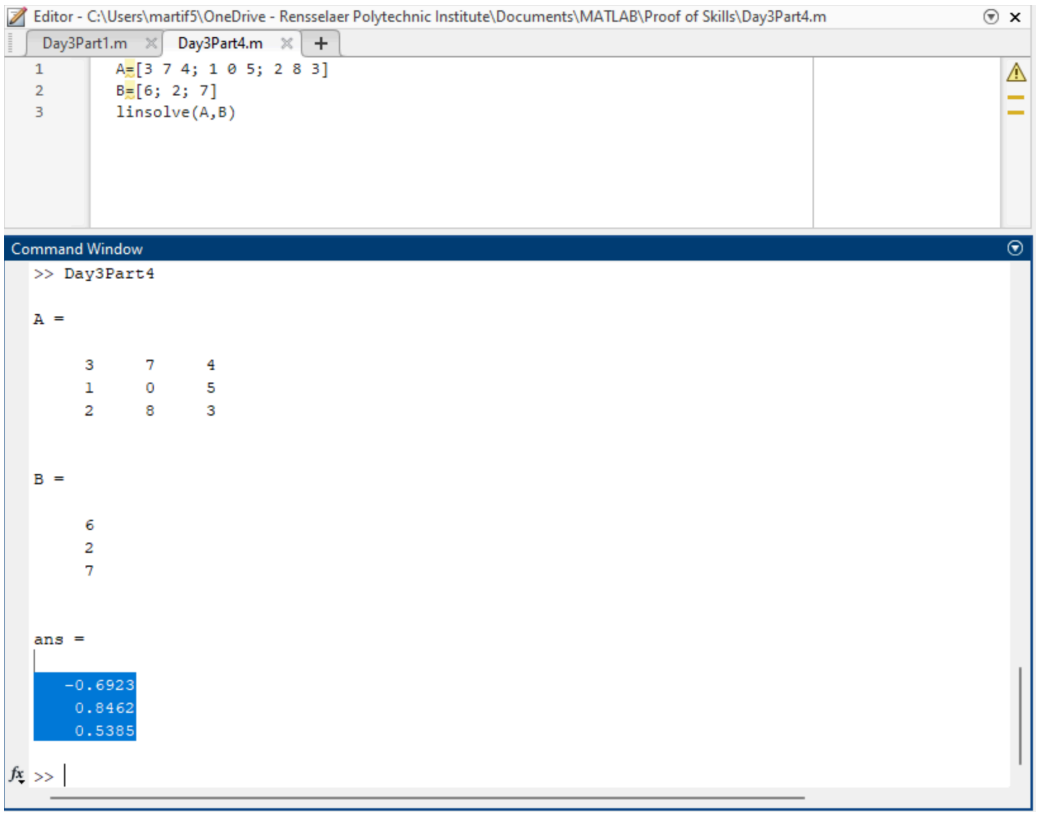
Frank Martino - Proof of Skills Analytical Calculations Day 3

Q3 Analytical Calculations with personal calculator (TI-XX) and MATLAB or equivalent

Prove your skill set in using tools for analytical calculations.

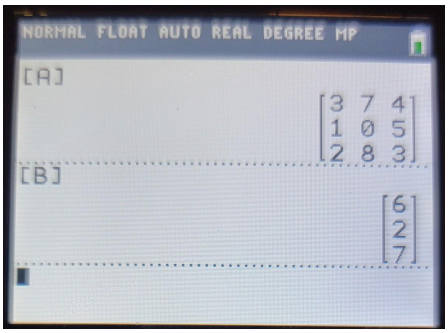
Q3.4 Solve linearly Independent Equations

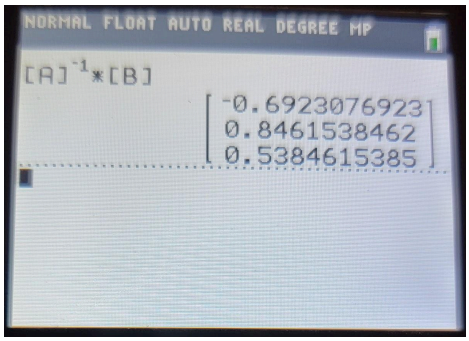
I can find the solutions for linear independent equations using the matrix function on my personal calculator (TI-XX) and compare it to the calculation in MATLAB

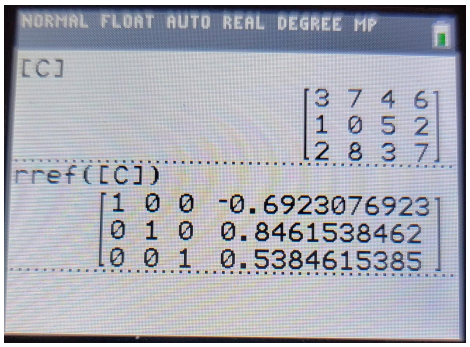


Above is a screenshot of my Matlab program where I first created 2 matrices A (the coefficient matrix 3x3) and B (the constant matrix 3x1). These matrices could be a set up for the three equations 3x+7y+4z=6, x+5z=2, and 2x+8y+3z=7. By simply using Matlab's linsolve function, we find that the solutions for each independent variable that would have been in the equations are x = -0.6923, y = 0.8462, and z = 0.5385.

January 21, 2024







Above are the exact same matrices A and B on a TI-84 CE. To solve for the solutions to the matrix, we can compute $A^{-1}*B$ (shown on the left) . Another method is to create another matrix C (a 3x4) where the first 3 columns are the same as matrix A and the last column is the same as matrix B. Then use the calculator rref function (shown on the right), which does the same operation as $A^{-1}*B$, but with less input needed.

Some practical uses of this are with circuit analysis where many equations created from Kirchoff's voltage and current laws or Ohm's law can be used to solve for the current or voltage across components.