Term 151
Math 280
MATLAB Assignment 3

- Write a MATLAB m-file that solves the following. Your answer to the questions asked should be typed within the file.
- Upload your work through BlackBoard.

1) Do Exercise 1 page 168.
2) Do Exercise 2 page 168.
3) Do Exercise 3 page 169.
4) Consider the homogeneous system

$$\begin{aligned}
7x_1 - 9x_2 - 4x_3 + 5x_4 + 3x_5 - 3x_6 - 7x_7 &= 0 \\
-4x_1 + 6x_2 + 7x_3 - 2x_4 - 6x_5 - 5x_6 + 5x_7 &= 0 \\
5x_1 - 7x_2 - 6x_3 + 5x_4 - 6x_5 + 2x_6 + 8x_7 &= 0 \\
-3x_1 + 5x_2 + 8x_3 - x_4 - 7x_5 - 4x_6 + 8x_7 &= 0 \\
6x_1 - 8x_2 - 5x_3 + 4x_4 + 4x_5 + 9x_6 + 3x_7 &= 0
\end{aligned}$$

   (i) Use MATLAB to find the basis for the space of solutions to this system.

   (ii) Let A be the coefficient matrix of the system above, find $\text{rank}(A)$.

5) Use MATLAB to find the dimension of $\text{span}(B)$ and obtain a basis for $\text{span}(B)$ consisting of elements of B, where

$B = \{(1, 1, 1)^T, (2, 0, 3)^T, (4, 2, 5)^T, (-1, 1, 0)^T, (1, -1, 2)^T\}$.