

## CSE541 Homework 7

Due Wednesday, May 21 at class time

**Exam II: Wednesday, May 28. Open books, open notes, calculators allowed.**

1. Apply Gaussian elimination to find  $x, y, z$  for the following set of equations. Pivot on the rows in the order given. Show all your work.

$$\begin{array}{rclcrcl} 2x & - & 2y & + & z & = & 6 \\ x & + & 4y & - & 2z & = & -2 \\ -3x & + & 4y & + & z & = & -1 \end{array}$$

2. Find  $x_1, x_2, x_3, x_4$  and  $x_5$  for the following set of equations. Show your work.

$$\begin{array}{rclcrcl} 4x_1 & + & x_2 & + & 2x_3 & + & 2x_4 & - & 3x_5 & = & 4 \\ 3x_2 & + & 5x_3 & - & x_4 & + & x_5 & = & -6 \\ & & 2x_3 & + & 3x_4 & - & x_5 & = & 5 \\ & & & & -x_4 & + & 2x_5 & = & 1 \\ & & & & & & 3x_5 & = & 6 \end{array}$$

3. Applying partial pivoting (without scaling), which equation (row) will be the next pivot equation (row). Show your work.

$$\begin{array}{rclcrcl} 3x_1 & + & 600x_2 & - & 14x_3 & + & 20x_4 & - & 9x_5 & = & 17 \\ & & 7x_2 & + & 60x_3 & - & 3,800x_4 & - & 7x_5 & = & 2 \\ & & 0.2x_2 & - & 3x_3 & - & 0.8x_4 & + & 1.5x_5 & = & 200 \\ & & 0.001x_2 & - & 40x_3 & - & 300x_4 & + & 8x_5 & = & 15 \\ & & 850x_2 & - & 9x_3 & + & 450x_4 & + & 61,000x_5 & = & 300 \end{array}$$

4. Applying *scaled* partial pivoting, which equation (row) will be the next pivot equation (row). Show your work.

$$\begin{array}{rclcrcl} 3x_1 & + & 600x_2 & - & 14x_3 & + & 20x_4 & - & 9x_5 & = & 17 \\ & & 7x_2 & + & 60x_3 & - & 3,800x_4 & - & 7x_5 & = & 2 \\ & & 0.2x_2 & - & 3x_3 & - & 0.8x_4 & + & 1.5x_5 & = & 200 \\ & & 0.001x_2 & - & 40x_3 & - & 300x_4 & + & 8x_5 & = & 15 \\ & & 850x_2 & - & 9x_3 & + & 450x_4 & + & 61,000x_5 & = & 300 \end{array}$$