Scaled Partial Pivoting Ex. 2

$3x_1 + 4x_2 + 3x_3 = 10$
$x_1 + 5x_2 - x_3 = 7$
$6x_1 + 3x_2 + 7x_3 = 15$

$\frac{3}{4}x_1 + x_2 + \frac{3}{4}x_3 = \frac{10}{4}$
$\frac{1}{5}x_1 + x_2 - \frac{1}{5}x_3 = \frac{7}{5}$
$\frac{6}{7}x_1 + \frac{3}{7}x_2 + x_3 = \frac{15}{7}$

$$\begin{bmatrix} 3 & 4 & 3 \\ 1 & 5 & -1 \\ 6 & 3 & 7 \end{bmatrix} = \begin{bmatrix} 10 \\ 7 \\ 15 \end{bmatrix}$$

scaling = [4, 5, 7]
rmax = $\frac{6}{7}$

$$\begin{bmatrix} 6 & 3 & 7 \\ 3 & 4 & 3 \\ 1 & 5 & -1 \end{bmatrix} = \begin{bmatrix} 15 \\ 10 \\ 7 \end{bmatrix}$$

new ind = [3, 1, 2]
$\frac{4}{4}, \frac{5}{5} = 1$
2nd run order equivalent

$$\begin{bmatrix} 6 & 3 & 7 \\ 0 & \frac{5}{2} & -\frac{1}{2} \\ 0 & \frac{9}{2} & -\frac{13}{6} \end{bmatrix} = \begin{bmatrix} 15 \\ \frac{5}{2} \\ \frac{9}{2} \end{bmatrix}$$

$-\text{row } 2\left(\frac{9}{5}\right)$

$$\begin{bmatrix} 6 & 3 & 7 \\ 0 & \frac{5}{2} & -\frac{1}{2} \\ 0 & 0 & \frac{-19}{15} \end{bmatrix} = \begin{bmatrix} 15 \\ \frac{5}{2} \\ 0 \end{bmatrix}$$

$\frac{-19}{15}x_3 = 0$
$x_3 = 0$

Back substitution

$x_3 = 0$
$\frac{5}{2}x_2 + 0 = \frac{5}{2}$ $\quad x_2 = 1$
$6x_1 + 3(1) + 0 = 15$
-3
$\frac{6x_1}{6} = \frac{12}{6}$ $\quad x_1 = 2$

$x_1 = 2 \quad x_2 = 1 \quad x_3 = 0$