Problem 4:

(a)

$$\boldsymbol{A} = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 3 & 0 & 3 & -4 \\ 1 & 1 & 1 & 2 \\ 2 & 3 & 1 & 3 \end{bmatrix}$$

$$\mathbf{b} = \begin{bmatrix} 0 \\ 7 \\ 6 \\ 6 \end{bmatrix}$$

(i) Partial pivoting The output from my code is

$$\mathbf{x} = \begin{bmatrix} 4 \\ -3 \\ 1 \\ 2 \end{bmatrix}$$

(ii) Scaled pivoting The output from my code is

$$\mathbf{x} = \begin{bmatrix} 4 \\ -3 \\ 1 \\ 2 \end{bmatrix}$$

(b)

$$\boldsymbol{A} = \begin{bmatrix} 0.2115 & 2.296 & 2.715 & 3.215 \\ 0.4371 & 3.916 & 1.683 & 2.852 \\ 6.099 & 4.324 & 23.20 & 1.578 \\ 4.623 & 0.8926 & 15.32 & 5.305 \end{bmatrix}$$

$$\mathbf{b} = \begin{bmatrix} 8.438 \\ 8.8888 \\ 35.20 \\ 26.14 \end{bmatrix}$$

(i) Partial pivoting The output from my code is

$$\mathbf{x} = \begin{bmatrix} 0.999081 \\ 0.999913 \\ 1.00021 \\ 1.0001 \end{bmatrix}$$

(ii) Scaled pivoting The output from my code is

$$\mathbf{x} = \begin{bmatrix} 0.999081 \\ 0.999913 \\ 1.00021 \\ 1.0001 \end{bmatrix}$$

Problem 5:

$$\boldsymbol{A} = \begin{bmatrix} -9 & 11 & -21 & 63 & -252 \\ 70 & -69 & 141 & -421 & 1684 \\ -575 & 575 & -1149 & 3451 & -13801 \\ 3891 & -3891 & 7782 & -23345 & 93365 \\ 1024 & -1024 & 2048 & -6144 & 24572 \end{bmatrix}$$

$$\mathbf{b} = \begin{bmatrix} -356 \\ 2385 \\ -19551 \\ 132274 \\ 34812 \end{bmatrix}$$

The output of scaled pivoting result is

$$\mathbf{x} = \begin{bmatrix} 1 \\ -0.864667 \\ 0.0848896 \\ 5.27044 \\ 2.64978 \end{bmatrix}$$