ASEN 5070 HW # 10

1. Program the Givens square root free algorithm (Eq. 5.4.70).

   Given the problem of HW # 8 i. e.,

$$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} 3 \\ 2 \end{bmatrix} = \begin{bmatrix} 1 & \delta \\ 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix}, \ \overline{X} = \begin{bmatrix} \overline{x}_1 \\ \overline{x}_2 \end{bmatrix} = \begin{bmatrix} 4 \\ 7 \end{bmatrix}, \ P_0 = \begin{bmatrix} 1/\delta^2 & 0 \\ 0 & 1/\delta^2 \end{bmatrix}$$

$$R = I, \ \delta = 1x10^{-2}, 1x10^{-4}, \ 1x10^{-6}, \ldots\ldots \ 1x10^{-16}$$

   a. For each value of δ solve for $\hat{X}$ and P_2. Compare your results for P_2 to the exact solution (Eq (4.7.24)) by plotting the trace difference as you did in HW # 8.
   b. For δ = $1x10^{-2}$, amaze your friends by demonstrating that $\sum_{i=1}^{2} e_i^2$ from your solution** agrees with the results obtained from Eq (5.4.33). See also Eq(5.6.21).

**Note $\sum_{i=1}^{2} e_i^2$ =$6.51300624x10^{-3}$ for this problem