Applied Data Analysis and Tools
Eigenvalue / Eigenvector Homework

Use MATLAB to answer the following questions. Copy and paste your session from the MATLAB Command Window into a text file to submit on Canvas.

1. Consider the following matrix.

$$\boldsymbol{A} = \begin{bmatrix} 9 & 0 \\ 7 & 5 \end{bmatrix}$$

   (a) Use MATLAB to find its eigenvalues and eigenvectors

   (b) Form the two characteristic equations and use MATLAB's `null` command to verify the eigenvectors.

   (c) Use MATLAB to verify that $\boldsymbol{A}\,\boldsymbol{x} = \lambda\boldsymbol{x}$ for each eigenvalue, eigenvector pair.

2. Use MATLAB's `roots` function to find the roots to the following polynomial.

$$x^4 + 4\,x^3 - 7\,x^2 - 22\,x + 24 = 0$$