1.

Aerospace Computing

Assignment 10

Due: 4/5/24

Search for Python routines that compute eigensystems (e.g. numpy.linalg.eig) and read the associated documentation. Input the matrices shown below and compute their eigensystems (eigenvalues and eigenvectors), then verify that they are indeed the correct results:

$$A = \begin{bmatrix} 9 & 6 & 0 & 0 & 0 \\ 0 & 9 & 0 & 0 & 0 \\ 0 & 0 & 9 & 0 & 0 \\ 0 & 0 & 0 & 9 & -5 \\ 0 & 0 & 0 & 0 & 9 \end{bmatrix} \qquad B = \begin{bmatrix} 52 & 4 & 6 & 8 & 9 & 12 \\ 2 & 54 & 6 & 8 & 9 & 12 \\ 2 & 4 & 56 & 8 & 9 & 12 \\ 2 & 4 & 6 & 58 & 9 & 12 \\ 2 & 4 & 6 & 8 & 59 & 12 \\ 2 & 4 & 6 & 8 & 9 & 62 \end{bmatrix}$$

For each matrix:

1. Print the eigenvalues.
2. Print the eigenvectors.
3. Verify in your notebook that they are solutions for the system.
4. For matrix B only compute a new eigenvector for the repeated eigenvalue.