diagonalization

exercise 2

Diagonalize the matrix $A = \begin{bmatrix} 1/2 & 3/2 \\ 3/2 & 1/2 \end{bmatrix}$.

eigenvalue decomposition summarized

- Let $\vec{v}_1, \vec{v}_2, \ldots, \vec{v}_n$ be the eigenvectors of matrix A and let $\lambda_1, \lambda_2, \ldots, \lambda_n$ be corresponding eigenvalues
- Consider now a matrix Q whose columns are $\vec{v}_1, \vec{v}_2, \ldots, \vec{v}_n$
- We have now

$$AQ = A \begin{bmatrix} | & | & | & | \\ \vec{v_1} & \vec{v_2} & \ldots & \vec{v_1} \\ | & | & | & | \end{bmatrix} = \begin{bmatrix} | & | & | & | \\ A\vec{v_1} & A\vec{v_2} & \ldots & A\vec{v_1} \\ | & | & | & | \end{bmatrix}$$