## ASSIGNMENT 04: FUNC OFF

- 1. Create an ip anonymous function that performs the standard inner product over  $\mathbb{C}$  and an ip\_norm anonymous function for its associated  $L^2$  norm.
- Create a gram\_schmidt function. The input should be a matrix of linearly independent columns and function handles that define an inner product and norm for the Gram-Schmidt process. The function should return a matrix of orthonormal column vectors.
- 3. Create an isorthogonal function that accepts two vectors and an inner product function handle. The function should return true if the vectors are orthogonal and false if they are not. Due to the numerical instability of the Gram-Schmidt process, our orthonormal vectors may not be exactly orthogonal. Take this into account by utilizing the eps function.
- 4. Calculate orthonormal vectors from the following linearly independent set:

$$S = \left\{ \begin{bmatrix} 1\\ j\\ 2-j\\ -1 \end{bmatrix}, \begin{bmatrix} 2+3j\\ 3j\\ 1-j\\ 2j \end{bmatrix}, \begin{bmatrix} -1+7j\\ 6+10j\\ 11-4j\\ 3+4j \end{bmatrix} \right\}$$
(1)

and store them into matrix U.

5. Check that the column vectors of U are all orthogonal and store the logical value into scalar orthogonal.