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.
2. 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:

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

   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`.

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