**Topic**: Discrete Fourier Transform

1. Construct a Fourier transformation matrix of size, by using the sequence. Where first column of the matrix is, second column is, similarly column is.
2. For a given length, verify that these sequences are orthogonal to each other. I.e.,
3. Verify the condition that, where is an Identity matrix. By using the condition
4. Consider a length input sequence (the example you have done in class) and compute the transformation coefficients using. Then from the obtained coefficients compute the inverse transformation, using.
5. Compute the transformation coefficients for a given input data sequence (given by TA), then from obtained coefficients compute the inverse transformation.

\***Note:** 1. Generalize your program as much as possible, which will be helpful for further labs

2. Zip all your files (includes soft copy and ‘.m’ files) and submit to respective lab TA.