**Topic**: Discrete Cosine Transform

**Generating Cosine transformation matrix and computing DCT**

1. Construct a Cosine transformation matrix of size, by using the sequence. Where the first row of the matrix is, second row is, similarly row is.
2. Verify the condition that, where is an Identity matrix. If the condition is satisfied then,
3. Consider a length input sequence (the example you have done in class) and compute the Cosine transformation coefficients using. Then from the obtained coefficients compute the inverse transformation, using.

**Computing DCT using DFT**

1. Generate a length sequence and compute its DFT (using previous lab3 code), and multiply the obtained DFT coefficients with. Consider the first coefficients and compare this with the DCT coefficients obtained in question 3, and write your observations.

**Normalized Transformation Matrix**

1. Repeat Question 1 and 2 for a normalized basis function

1. Repeat Question 3 with the newly obtained transformation matrix in Question 5.

**Lab9:**

**Energy Compaction Property**

**Energy Compaction Efficiency Comparison b/w DFT and DCT**

\***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.