

Assignment-5

Q1. Describe the overlap-save method of performing linear convolution of long data sequences. Compare its merits and demerits with overlap-add method.

Q2. Considering the complex multiplications and complex additions resulted from radix-2 FFT algorithm, discuss the effectiveness of computing linear convolution using circular convolution. Please provide necessary quantitative number of computations in the discussion.

Q3. Describe and derive the radix-2 decimation-in-frequency (DIF) FFT algorithm and compare it with radix-2 decimation-in-time (DIT) FFT algorithm.

Q4. Show that the W_N^{kn} can be computed recursively as follows: $W_N^{kn} = W_N^k W_N^{k(n-1)}$

Q5. A designer has eight-point FFT chips. Show explicitly how three such chips can be interconnected to compute a 24-point DFT.