Digital Signal Processing Lab

Experiment -13: Interpolation of Signal Time and Frequency Domain

I Pre-Lab Questions: (13a)

1. What is the difference b/w up sampling and Interpolation?

Soln. Sampling rate Conversion Systems are used to change the sampling rate of a signal. The process of sampling rate decrease is called decimation and the process of sampling rate increase is called interpolation.

2. Compare Decimation and Interpolation.

Soln. Decimation:

- To Reduce Sampling rate of discrete time signal.
- Low Sampling rate reduces Storage and Computation requirements.

Interpolation:

- Increase Sampling rate of a discrete-time signal.
- Here Sampling rate increases fidelity.

II Pre-Lab Questions (13 b)

1. Explain how the interpolation in frequency domain is advantageous over time domain interpolation?

Soln. Time domain ~~requires~~ refers to / display the change in a signal over a span of time. and frequency domain displays how much of the signal exists within a given band concerning a range of frequencies.

2. Compare time domain and frequency domain interpolation in coding logic.

Soln. Frequency domain interpolation uses unsampled input data. Plot the FFT plotting. Un Complig is performed by zero padding the middle samples of input sequence.

Time domain interpolation by a factor of is implemented by adding a cyclic prefix and upsampling sequence by zero padding the sample - upsampled are filtered by an FIR Low pass filter and sent to channel.