I Pre-Lab Questions: (14a)

1. What is difference between down Sampling and decimation?

Soln. Decimation is process of reducing the Sampling rate. In practice, this usually implies low-pass filtering a Signal.

Downsampling is a process of throwing away Sample without the low pass filtering operation.

2. What is the decimation factor?

Soln. Decimation factor is Simple ratio of input rate to the output rate. usually Symbolized by M.

$$\frac{Input \ rate}{output \ rate} = M.$$

M - Symbol of Decimation Factor.
L - Symbol of interpolation Factor.

II Post-Lab Questions: (14a).

1. What happens if we violate Nyquist Criteria in down Sampling or decimation?

Soln. It results in aliasing just as with other cases of violating the Nyquist Criteria. Aliasing is a type of distortion which cannot be reversed once its occures.

2. What Signals can be down Sampled?

Soln. A Signal can be downSampled (without doing any filtering) whenever it is "over Sampled" that is, Specifically on highest frequency Component must be less than half of the post-decimation Sampling.

III Pre-Lab Questions (146)

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

Soln Decimation in frequency domain is a constant view, hence there can be better interpolation. Noise power is reduced to give better SNR performance. Time domain is formed by averaging samples giving a discontinuous view.

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

Soln In time domain averaging of samples is required hence there is a greater need for more numbers of variables to complete calculations. Time domain uses the command plot <33 () which gives a discrete signal. Frequency domain uses plot() command giving continuous signal.

IV Post-Lab Questions (14b)

1. What is need for anti-aliasing filter prior to down sampling?

Soln An anti-aliasing filter is used before the A-to-D conversion, to concentrate prevent alley frequencies more large positions of the testing 1st form being digitized, which would create false or undesirable frequencies.

2. Define sampling rate conversion

Soln Sampling rate conversion is the process of changing the sampling rate of a discrete signal to obtain a new discrete representation of the underlying continuous signal. applications include image scale and audio/video signals

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