9, 20, 18

Question from a student concerning the parameters for a spectrogram

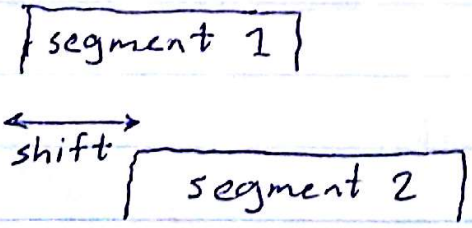
By selecting a bigger window for spectrogram

→ Freq. resolution is much more better. (more details)

$\Delta f = \frac{f_s}{N}$ → number of samples in 1 second

For $N = 8000$ in spectrogram, $f_s = 8000$ (Hz) → $\Delta f = \frac{8000\,(Hz)}{8000} = 1$

shift determines what happens in time domain



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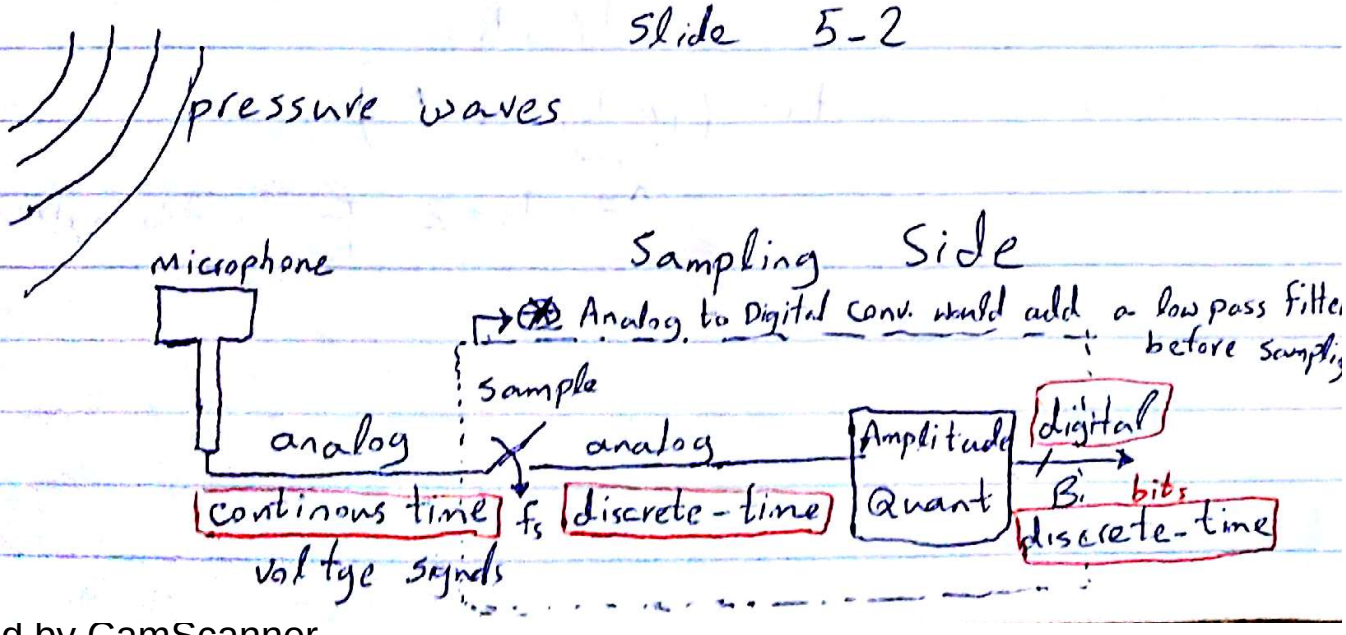

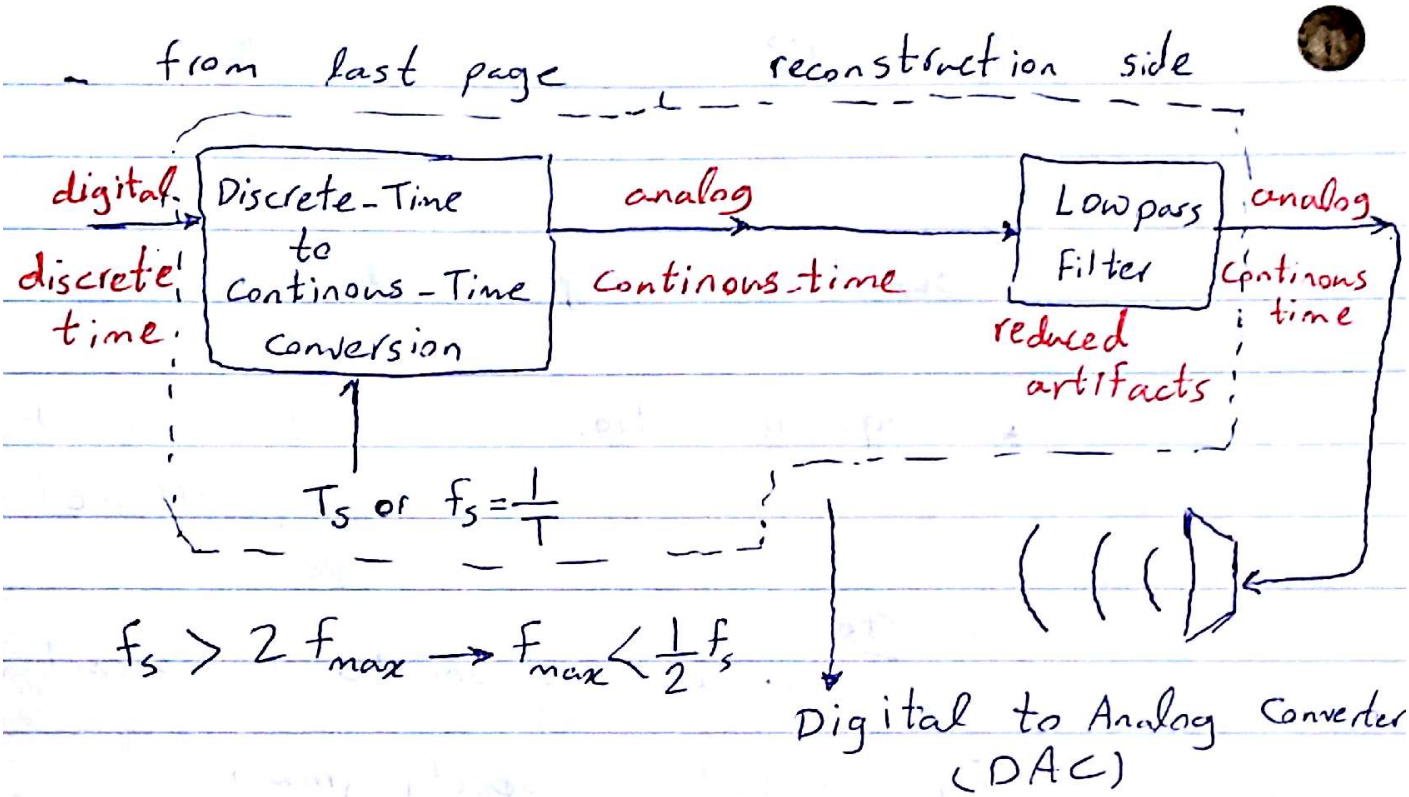

reduce artifacts → reduce content of frequencies above and at $\frac{1}{2} f_s$

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$$x(t) = A\cos(\omega t + \phi)$$

$$x[n] = X(t)\Big|_{t=nT_s} = A\cos(\omega(nT_s + \phi)) =$$

$$= A\cos((\underbrace{\omega T_s}) n + \phi)$$

$$\hat{\omega} = \omega T_s = 2\pi \frac{f}{f_s} \quad [\text{rad/sample}]$$