LECTURE 10
FFT

MANU 465

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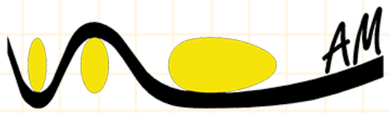

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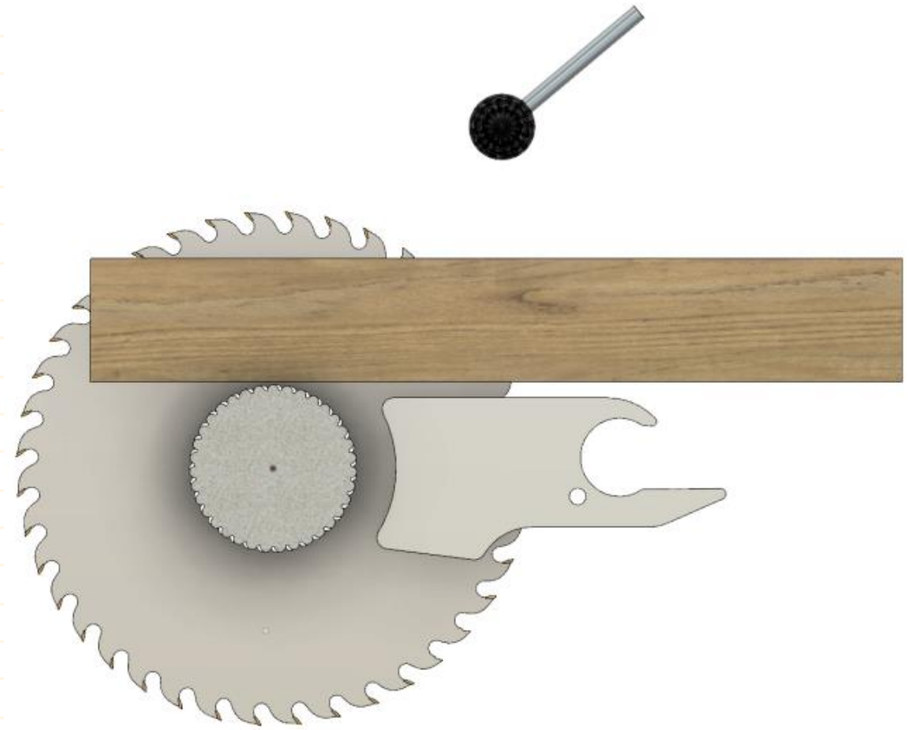
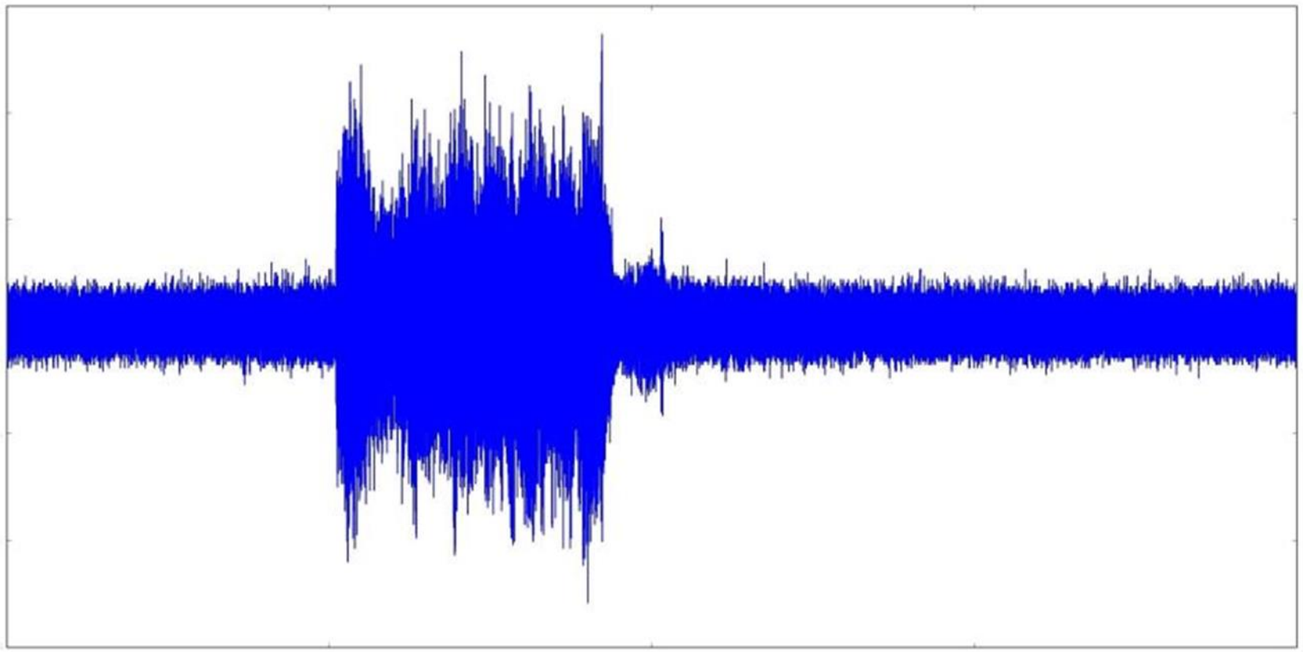
Time Sequence data

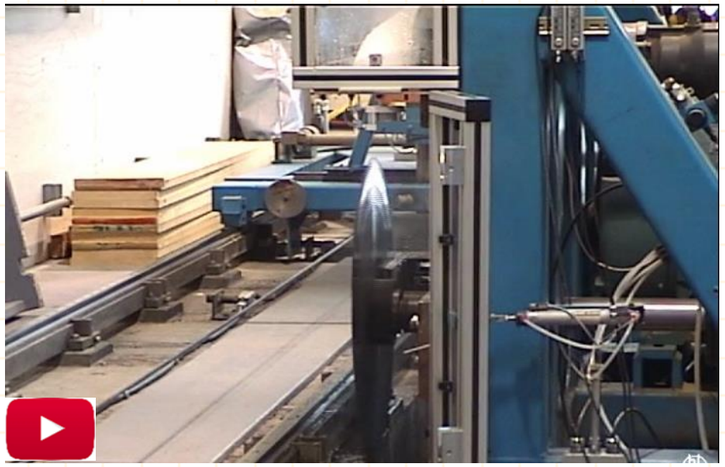
- Useful for displaying data variation (trend) in time

Example) Hotel Occupancy (%) each month 2016-2013

But sometimes it is not possible to get a meaningful information from a time sequence plot, for example, the recorded sound of a saw in this experiment:

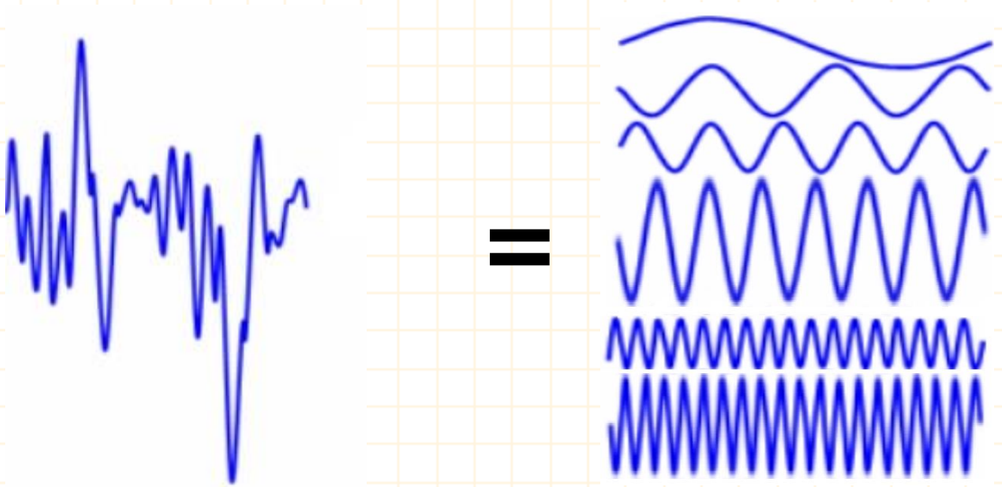






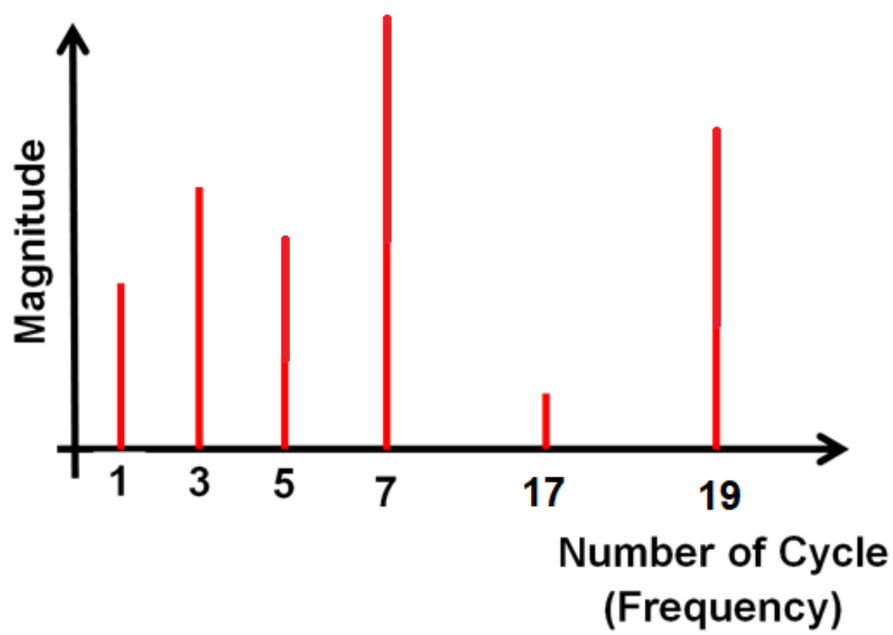
In this case, we may transfer the time series data into a different domain, i.e. Frequency domain, using **Fourier Transformation**.

Fourier Transformation



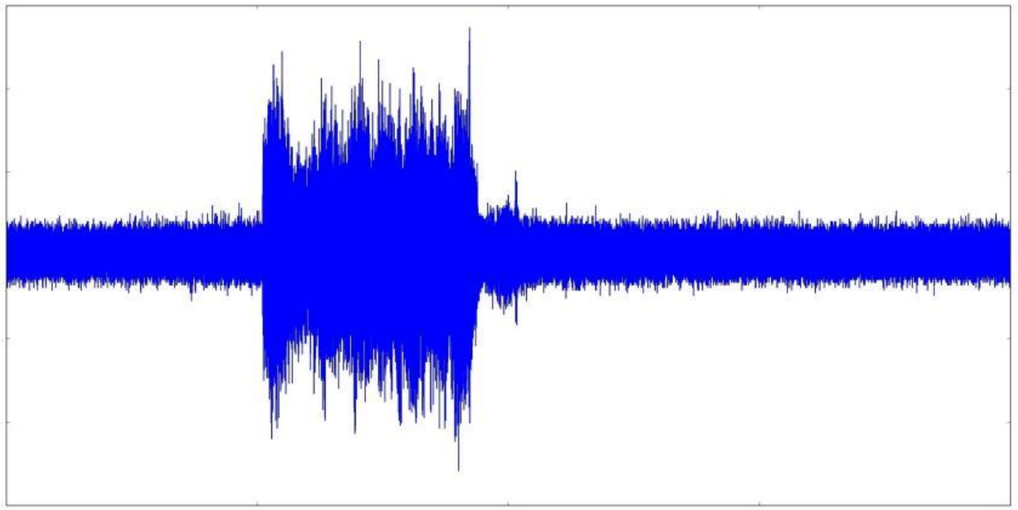
No Analytical Formula

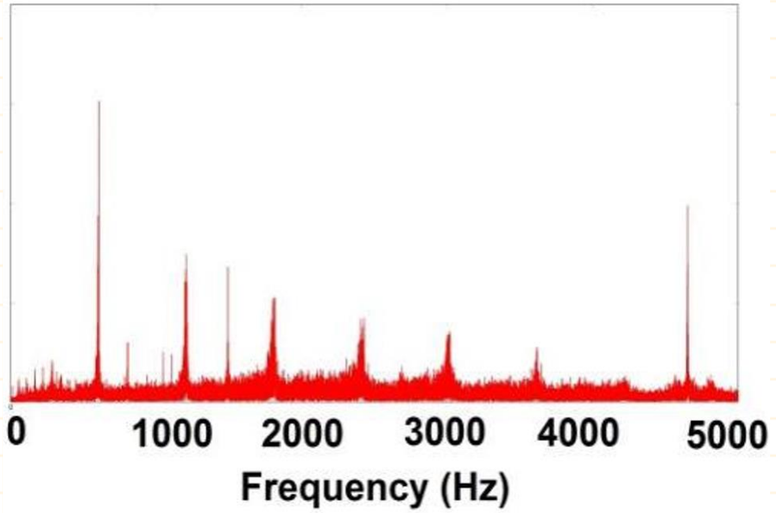
Sum of many sine waves



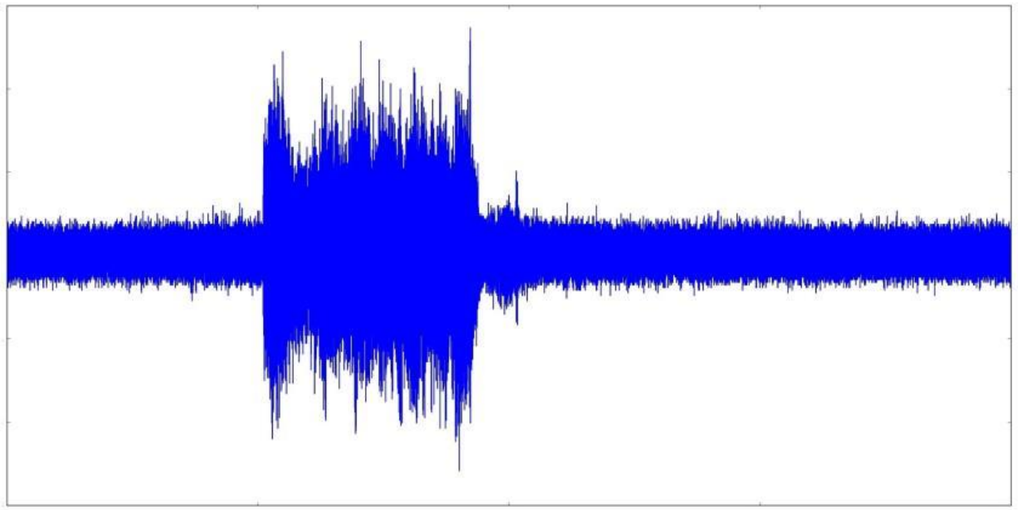
- Frequency-domain graphs– aka spectrum plots and Fast Fourier Transform graphs (FFT)- show which frequencies are present in a signal and how much of each one is present.
- The Magnitude are the coefficients of the sines and cosines of the various frequencies required to reconstruct the original signal.

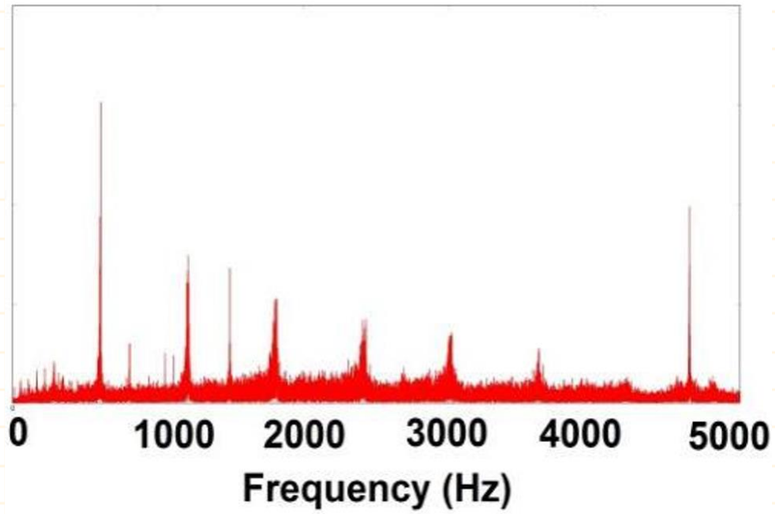
If we apply the FFT to the saw sound data:





Issue with FFT





Short FT (STFT)