Lecture 8 Discrete-Time Convolution (Part 1)   Fall 2018

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$$M = N-1$$

$$x[n] \rightarrow \boxed{FIR} \rightarrow y[n] = \sum_{k=0}^{M} b_k x[n-k]$$

$$\delta[n]$$

$$h[n]$$
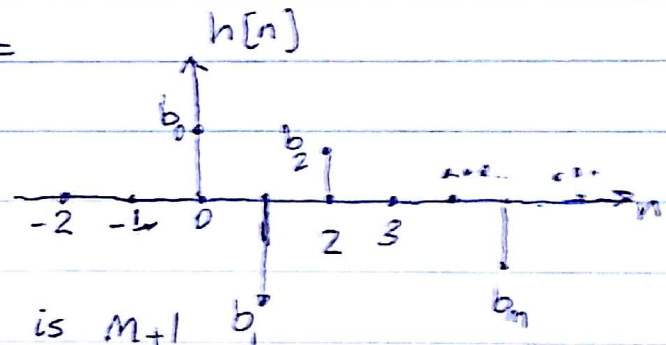
impulse response

$\delta[n]$

M is order

N determines number of coefficients

$$h[n] = \sum_{k=0}^{\infty} b_k \delta[n-k] =$$

$h[n]$

$$n - k = 0 \rightarrow n = k$$

extent in discrete time is $M+1$ samples

* denotes convolution

$$y[n] = x[n] * h[n] = \sum_{k=0}^{M} h[k] x[n-k] = h[0] x[n] +$$

$$h[1] x[n-1] + h[2] x[n-2] + \cdots + h[M] x[n-M]$$

First Order Difference

$$y[n] = x[n] - x[n-1]$$

$h[n]$