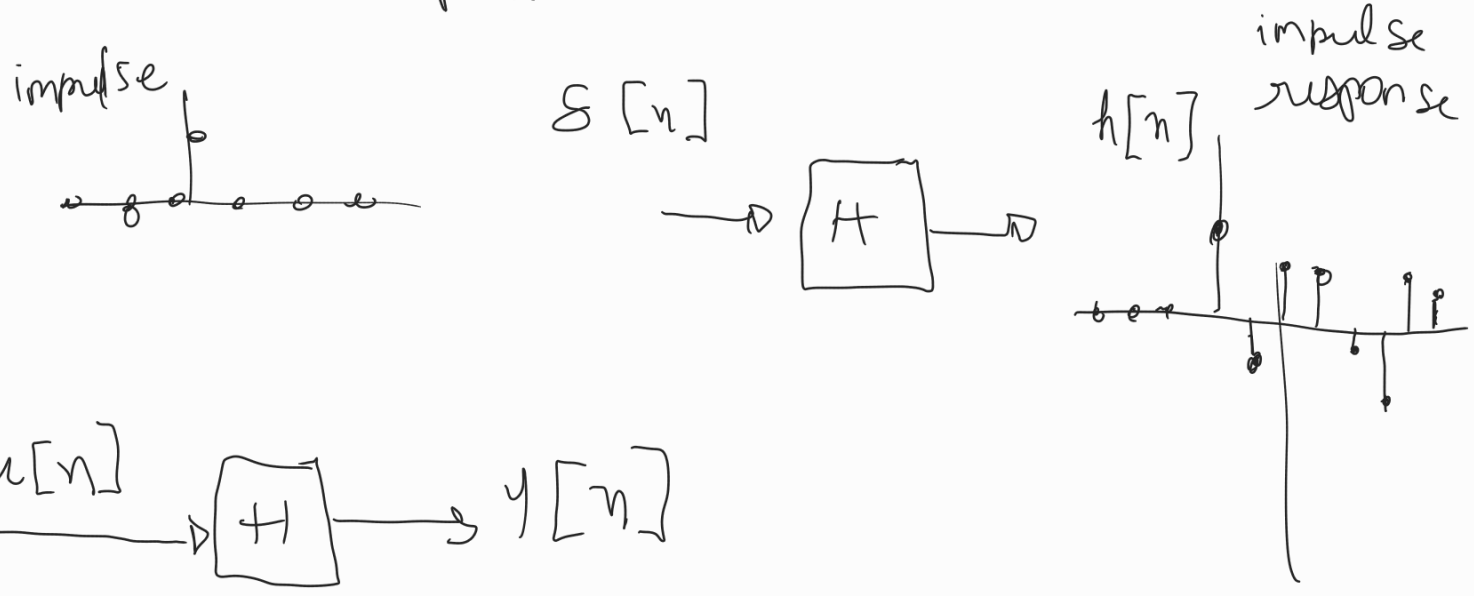
Impulse Response Descriptions for LTI System

Characterizing linear, time-invariant systems using canonical inputs —

1) write arbitrary input as a weighted sum of time-shifted cannonical input

2) output is a weighted sum of time-shifted canonical outputs



$$y[n] = \sum_{k=-\infty}^{\infty} h[k]\,x[n-k] = h[n] * x[n]$$

"convolution"

operator notation

Properties:

'causal' system

$$y[n] = \sum_{k=-\infty}^{\infty} h[k] x[n-k]$$

$$= \ldots + h[-2] x[n+2] + h[-1] x[n+1] + h[0]$$

$$x[n] + h[1] x[n-1] + \ldots$$