

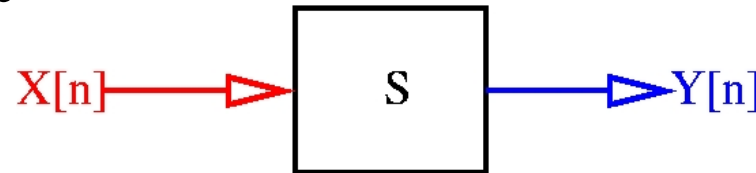
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# LSI (LTI) Systems

Why LSI: Linear Shift Invariant

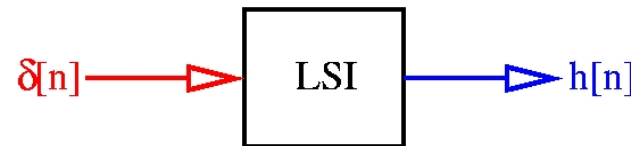


- Linearity:
  - Additivity:  $x_1[n] + x_2[n] \rightarrow y_1[n] + y_2[n]$
  - Homogeneity:  $a x[n] \rightarrow a y[n]$
- Shift-Invariance:  $x[n - n_0] \rightarrow y[n - n_0]$
- Only LSI systems: described both in terms of frequency, & time/spatial behaviour

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# Convolution

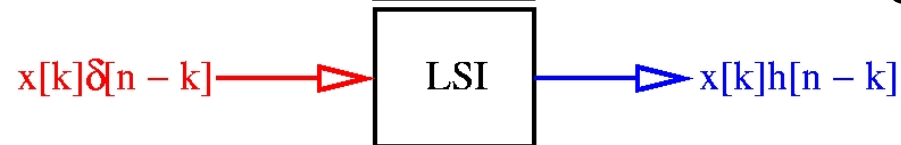
$$x[n] * h[n] \triangleq \sum_k x[k] h[n - k]$$



Impulse Response



Shift Invariance



Homogeneity



Additivity