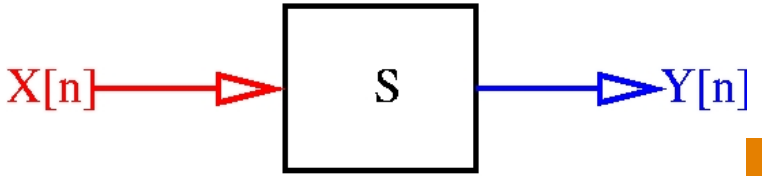
LSI (LTI) Systems

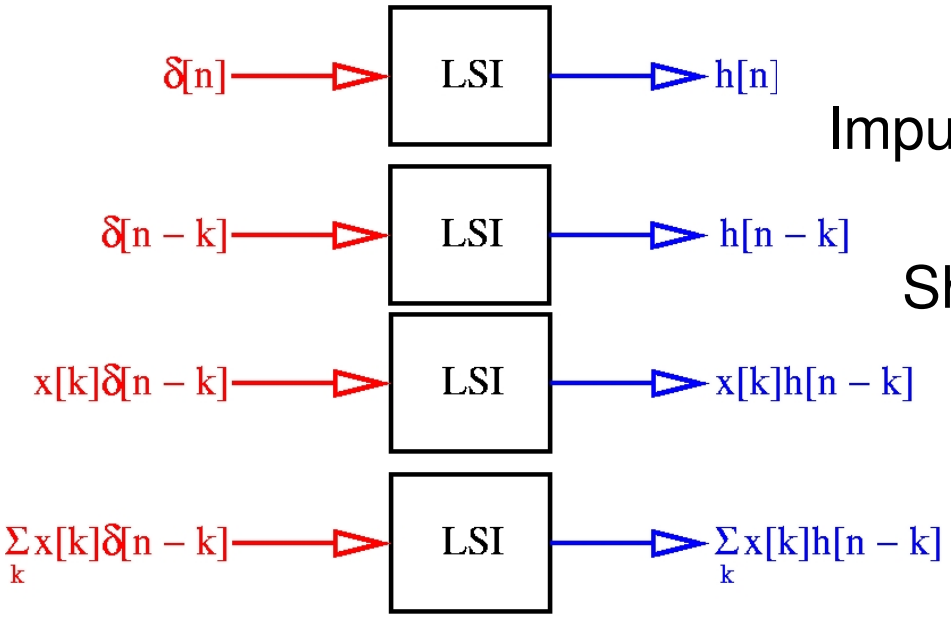
Why LSI: Linear Shift Invariant



- 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

Convolution

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



Impulse Response

Shift Invariance

Homogeneity

Additivity