

$$x[n] \quad y[n] = b_0 x[n] + b_1 x[n-1] + b_2 x[n-2] + b_3 x[n-3]$$

\uparrow
 \uparrow
 \uparrow
 \uparrow
 \uparrow

$x[12]$	$x[13]$	$x[14]$	(15)	k	17	18	19	20	21	22	23
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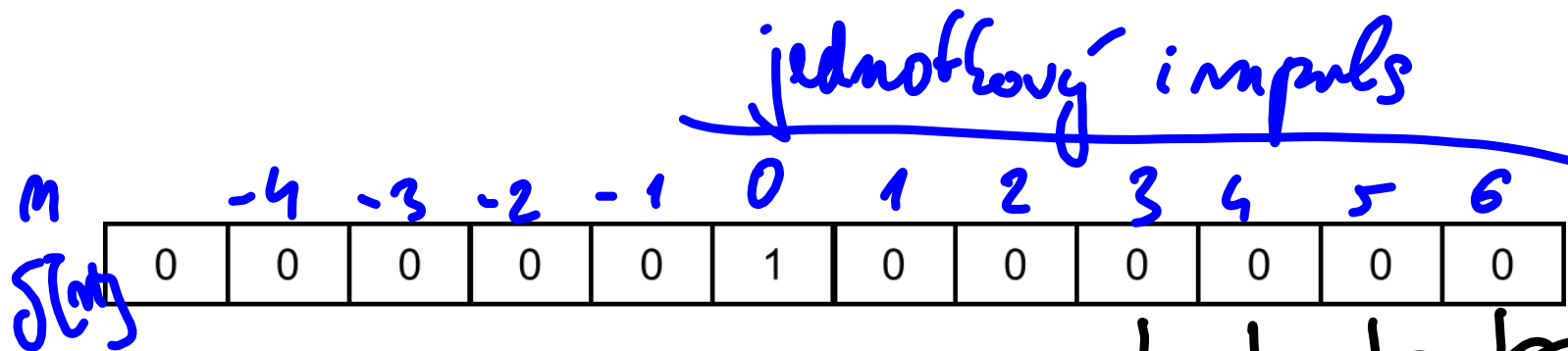
$x[22]$	$y[23]$	14	15	16	17	18	19	20	21	22	23
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$$y[23] = h[0] \cdot x[23] + h[1] x[22] + h[2] x[21] + h[3] x[20]$$

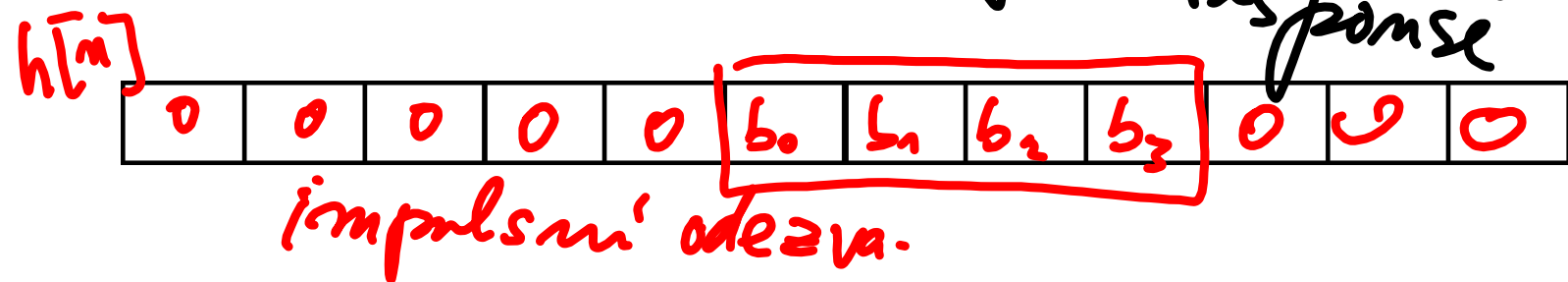
$$y[n] = h[0] x[n] + h[1] x[n-1] + h[2] x[n-2] + h[3] x[n-3]$$

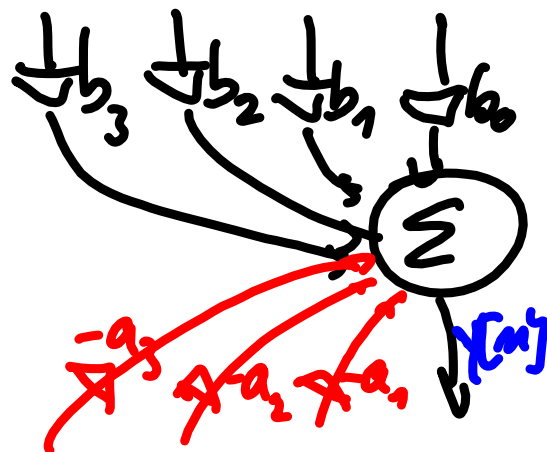
$$= \sum_{k=0}^3 x[n-k] h[k]$$

$$= \sum_{k=20}^{23} x[k] h[23-k] = \sum_{k=n-3}^n x[k] h[n-k]$$



FIR - finite impulse response



$x[n]$  $y[n]$ 